NOTEBOOK

SERVICE MANUAL

Notebook Computer

M190S/M192S

Service Manual

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About this Manual

This manual is intended for service personnel who have completed sufficient training to undertake the maintenance and inspection of personal computers.

It is organized to allow you to look up basic information for servicing and/or upgrading components of the Notebook PC. The following information is included:

Chapter 1, Introduction, provides general information about the location of system elements and their specifications.
Chapter 2, Disassembly, provides step-by-step instructions for disassembling parts and subsystems and how to upgrade elements of the system.
Appendix A, Part Lists
Appendix B, Schematic Diagrams

Related Documents

You may also need to consult the following manual for additional information:

User's Manual on CD

This describes the notebook PC's features and the procedures for operating the computer and its ROM-based setup program. It also describes the installation and operation of the utility programs provided with the notebook PC.

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1: Introduction

Overview

This manual covers the information you need to service or upgrade the M190S/M192S notebook computer. Information about operating the computer (e.g. getting started, and the *Setup* utility) is in the *User's Manual*. Information about drivers (e.g. VGA & audio) is also found in *User's Manual*. That manual is shipped with the computer.

Operating systems (e.g. *DOS, Windows 9x, Windows NT 4.0, Windows 2000, Windows XP, OS/2 Warp, UNIX,* etc.) have their own manuals as do application software (e.g. word processing and database programs). If you have questions about those programs, you should consult those manuals.

The M190S/M192S notebook is designed to be upgradeable. See ***"Disassembly" on page 2 - 1*** for a detailed description of the upgrade procedures for each specific component. Please note the warning and safety information indicated by the " " symbol.

The balance of this chapter reviews the computer's technical specifications and features.

System Specifications

Structure

- PC 99 Compliant

Processor

- Mobile Intel Pentium 4 Processor-M (478-pin) uFC-PGA package
  0.13 Micron Process Technology - 1.4/1.5/1.6/1.7/1.8/1.9/2.0 GHz

- Mobile Intel Celeron Processor (478-pin) uFC-PGA package
  0.13 Micron Process Technology - 1.4/1.5/1.6/1.7/1.8 GHz

Memory

- Two 200-pin SODIMM sockets, supporting DDR200/266MHz DRAM
- Expandable memory up to 1024MB (128/256/512 MB SODIMM Modules supported)

Core Logic

- SIS650 chipset

BIOS

- One 256KB Flash ROM
- Phoenix BIOS

LCD

- 12.1" XGA TFT flat panel (1024 * 768)

Display

- Integrated 128-bit 2D/3D Graphics Accelerator
  Advanced HW Acceleration for DVD Playback
  Fully DirectX 8 Compliant Graphics Engine
- Shared memory up to 16/32/64MB DDR SDRAM
- Dual-view Display Monitor

Storage

- External IDE **Combo Drive** for the following combination options:
  CD-ROM & FDD

  DVD-ROM & FDD

  CD-R/ CD-RW/ CD-ROM & FDD

  CD-R/ CD-RW/ CD-ROM & CD-ROM

  CD-R/ CD-RW/ CD-ROM & DVD-ROM

  DVD/ CD-R/ CD-RW/ CD-ROM Combi & FDD

- Easy changeable 2.5" 9.5 mm (h) HDD
  Supports Master mode IDE
  Supports LBA mode
  Supports PIO mode 4
  ATA-33/66/100
  Ultra DMA

Security

- Security (Kensington® Type) Lock Slot
- BIOS Password

Audio

- AC'97 2.1 Compliant Interface
- 3D stereo enhanced sound system
- Compatible with Sound-Blaster PRO
- S/PDIF digital output (51.CH)
- Built-in microphone
- 2 built-in speakers

Keyboard

- WinKEY multi-language keyboard

PC Card Sockets

- One type-II (PCI) PCMCIA 3.3V/5V socket

Interface

- Built-in Touchpad with scrolling function
- One PS2 port
- Two USB 2.0 ports
- One mini- IEEE 1394 port
- One external IDE connector for Combo Drive
- One infrared file transfer IrDA1.1, SIR/ FIR /ASKIR
- One external CRT monitor port
- One headphone-out jack
- One microphone-in jack
- One S/P DIF Output jack
- One GSM/CDMA headphone/speaker jack
- One RJ-11 jack for Plug & Play Fax/Modem
- One RJ-45 jack for 10M/ 100M Fast Ethernet
- DC-in jack
- Three built-in instant keys - email/internet/application

Communication

- 56K Plug & Play Fax/Modem V.90 & V.92 compliant
- 10M/100M Fast Ethernet (IEEE 802.3 and 802.3u Standard Compliant)
- Infrared file transfer IrDA1.1, FIR/SIR/ASKIR
- CDMA modem module (**optional**)
- GPRS modem module (**optional**)

Power Management

- Supports ACPI v1.0b
- Supports Hibernate mode
- Supports Standby mode
- Supports battery low sleep
- Supports resume from modem ring

Power

- Full Range AC adapter -65W, AC-in 100~240V, 50~60Hz,
- DC output 20V
- Main battery smart Li-ion 44.4W (removable)
- Ultra battery smart Li-ion 88.8W (removable)

Indicator

- LED indicators (GSM/GPRS/CDMA, Power/Sleep, Charger, FDD/ CD-ROM, HDD, Num Lock, Caps Lock, Scroll Lock)

Environmental Spec

- Temperature:
  Operating: 5ºC ~ 35ºC
  Non-Operating: -20ºC ~ 60ºC

- Relative Humidity:
  Operating: 20% ~ 80%
  Non-Operating: 10% ~ 90%

Physical

- 274(w) x 230(d) x 31(h) mm

Weight

- 1.95kg

Optional

- Standard smart Li-ion battery pack, 44.4 Watt
- Ultra smart Li-ion battery pack, 88.8 Watt
- External IDE Combo Drive Options:

  CD-ROM & FDD

  DVD-ROM & FDD

  CD-R/ CD-RW/ CD-ROM & FDD

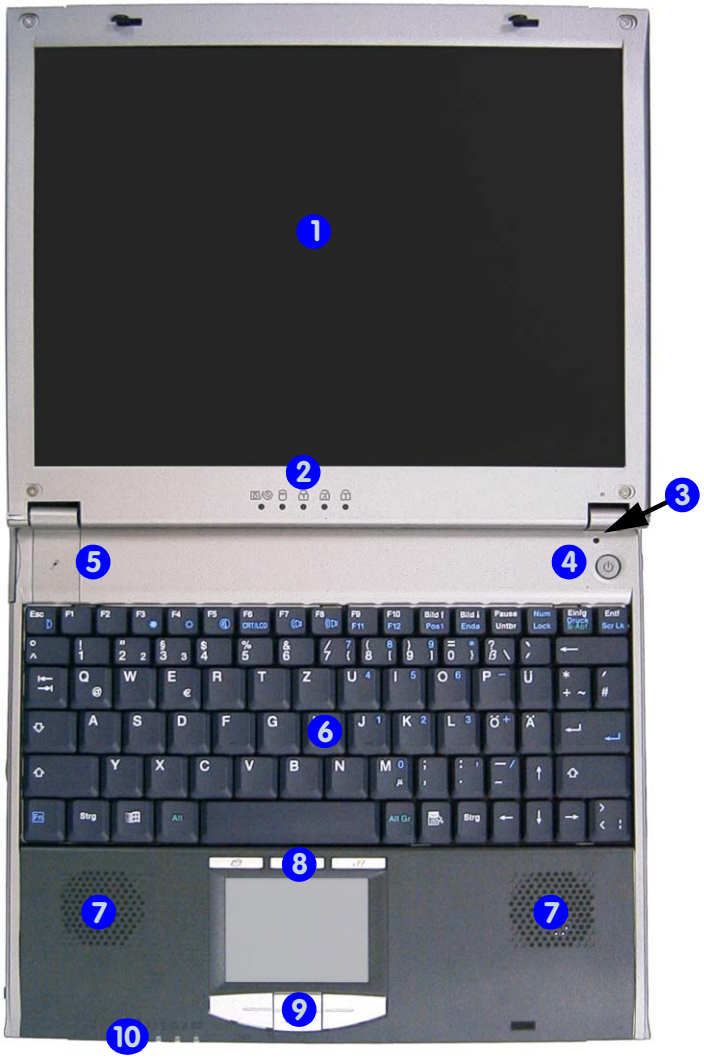
  CD-R/ CD-RW/ CD-ROM & CD-ROM

  CD-R/ CD-RW/ CD-ROM & DVD-ROM

  DVD/ CD-R/ CD-RW/ CD-ROM Combi & FDD

- Internal CDMA module
- Internal GPRS module

External Locator - Top Views



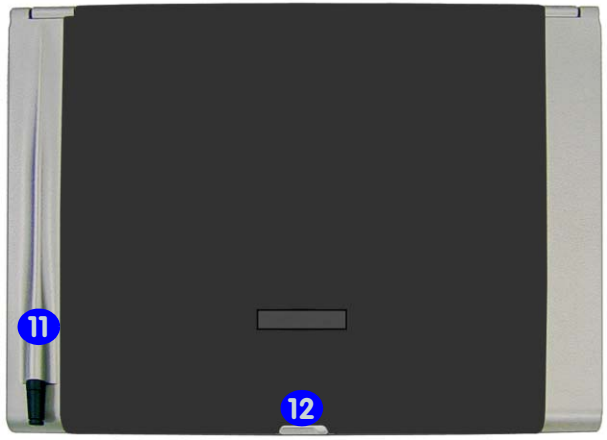


Figure 1 - 1
Top Views

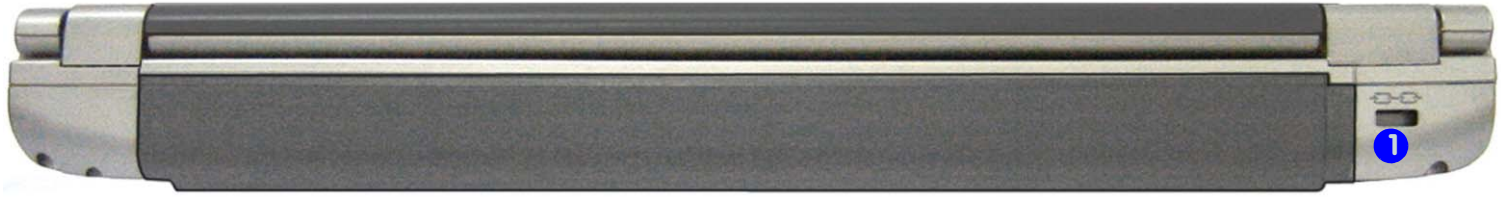
1. LCD Panel
2. LED Status Indicators
3. Close Cover Switch
4. Power Button
5. Built-In Microphone
6. Keyboard
7. Speakers
8. Hot-Key Buttons
9. TouchPad & Buttons
10. LED Power & Communication Indicators
11. Phone Antenna
12. LCD Latch

External Locator - Front and Rear View

Figure 1 - 2
Front View

1. Phone Antenna
2. Infrared Transceiver
3. Communication LED
4. Power LED
5. Battery LED
6. S/PDIF Port
7. Microphone-In Port
8. Headphone-Out Port
9. LCD Latch

Figure 1 - 3
Rear View



1. Security Lock

External Locator - Right View

Figure 1 - 4
Right View

1. Hard Disk Bay
2. Dual USB Ports
3. Vent
4. Modem & LAN Jacks

External Locator - Left View

Figure 1 - 5
Left View

1. Antenna Raised
2. External Monitor (CRT) Port
3. DC-In Jack
4. PS/2 Port
5. Telephone Headset Jack
6. External IDE Device Port
7. Mini IEEE 1394 Port
8. PC Card Slot
9. PC Card Eject Button
10. External IDE Combo Device

Bay Manager Driver

Please make you have installed the Bay Manager driver (**See What to Install on page 4-2 of the User's Manual**) to enable you to connect/disconnect the drive while the computer is on. If the driver is not installed the drive must be connected before you start-up the computer.

External Locator - Bottom View

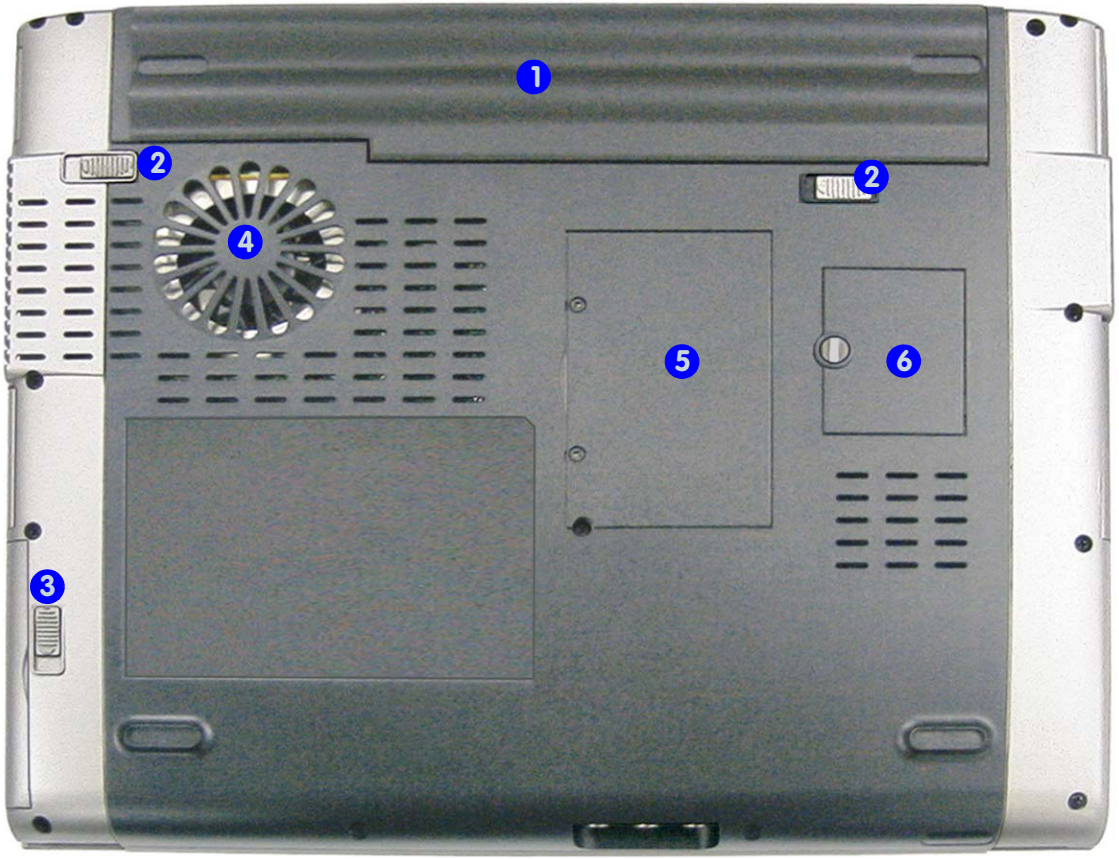


Figure 1 - 6
Bottom View

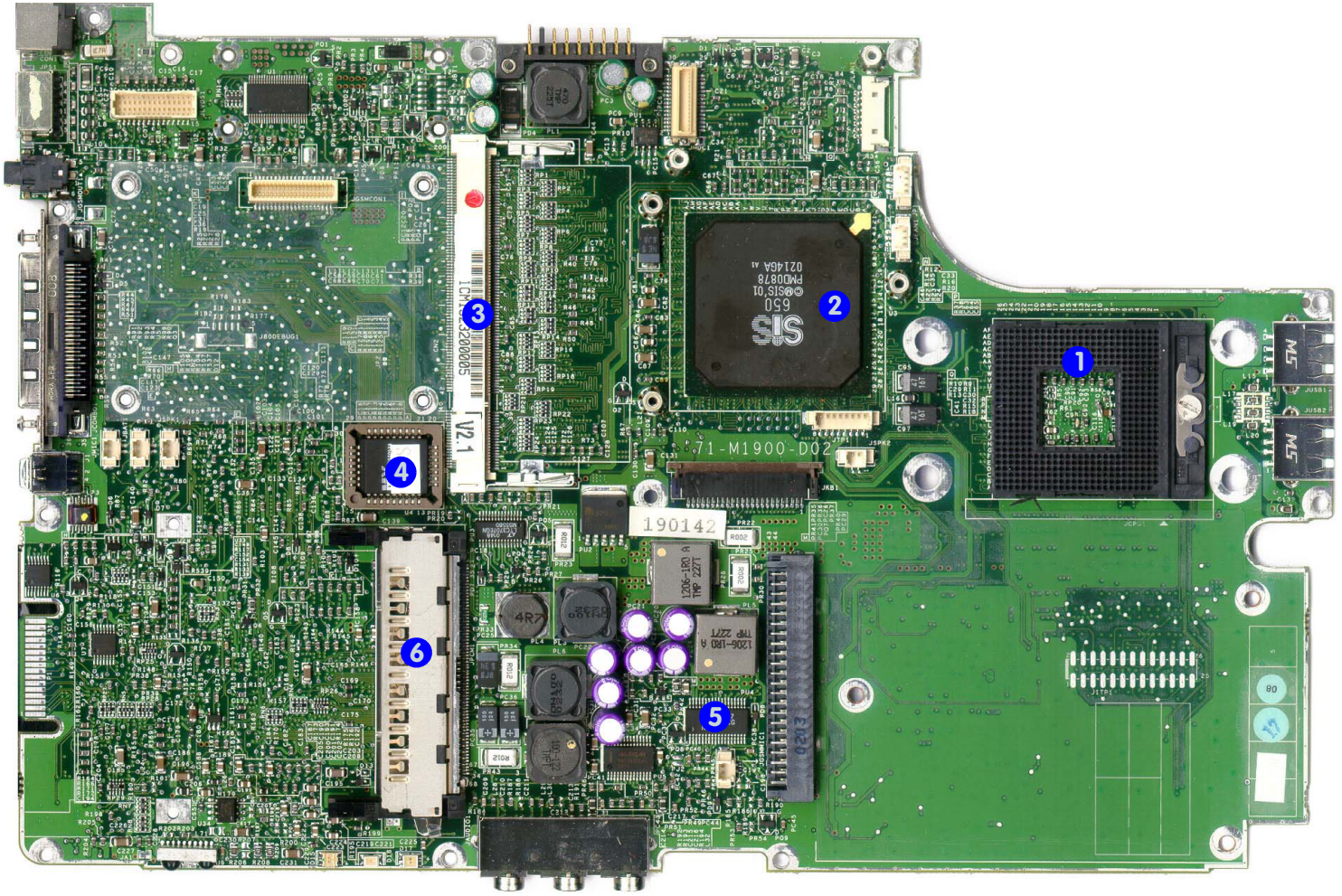
1. Battery
2. Battery Release Latches
3. Hard Disk Release Latch
4. Fan Outlet
5. RAM Cover
6. SIM Card Cover

Mainboard Overview - Top

Key Parts

Figure 1 - 7
Mainboard Top Key Parts - 1

1. CPU Socket (no CPU installed)
2. SiS650 Chipset
3. 1 * SO-DIMM socket
4. Flash ROM BIOS
5. V_Core
6. PCMCIA



Mainboard Overview - Bottom

Key Parts

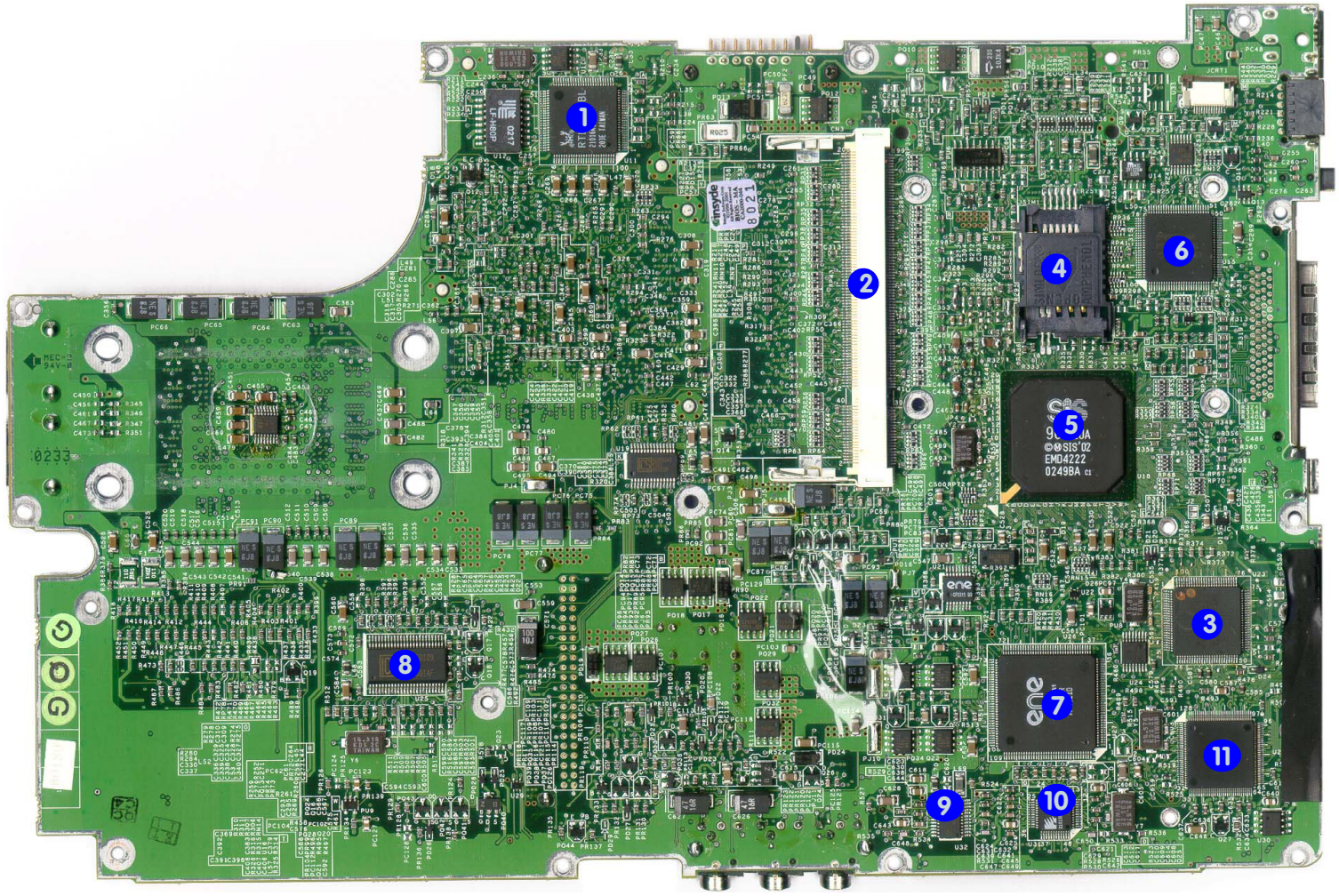


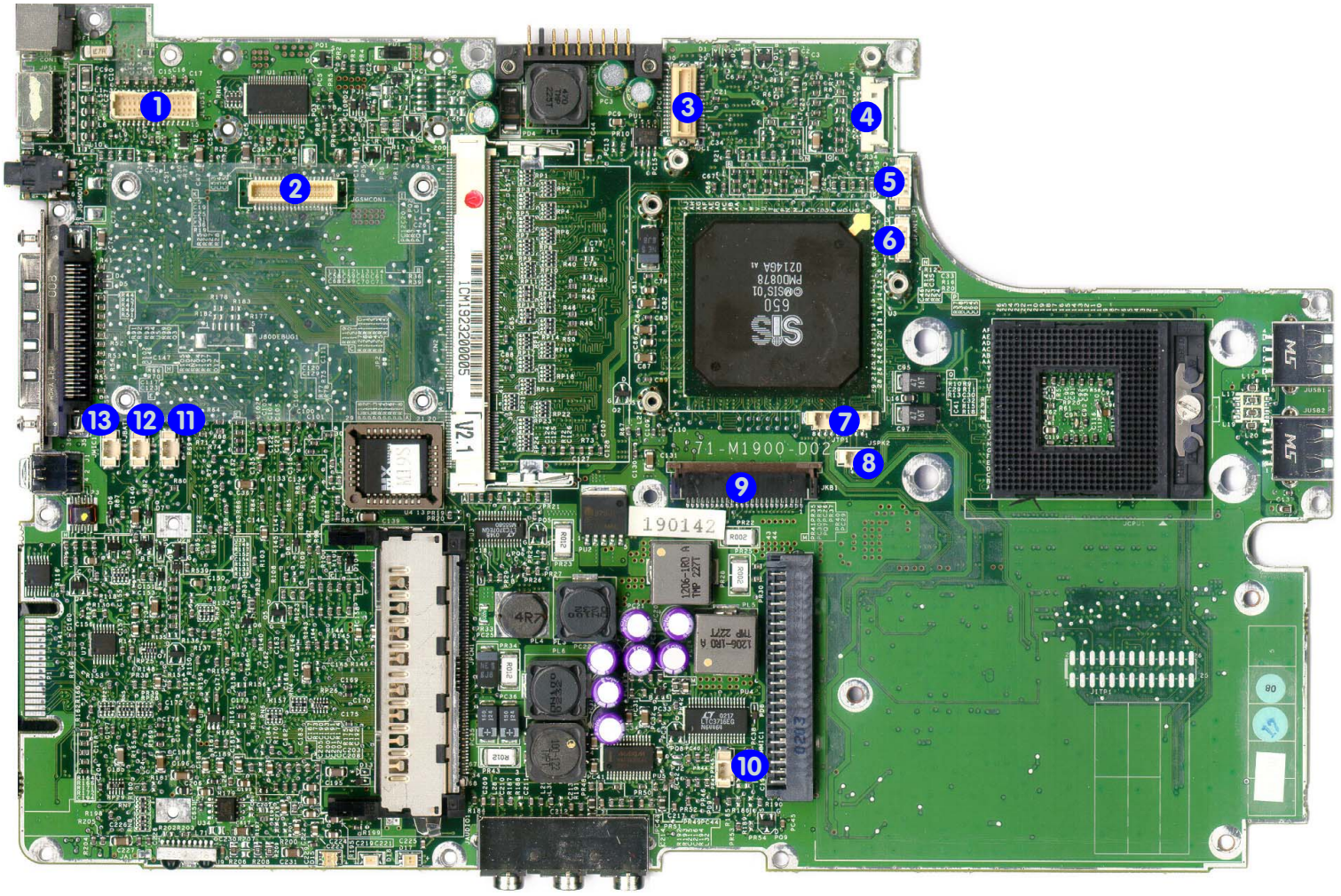
Figure 1 - 8
Mainboard Bottom Key Parts

1. Realtek RTL8100L Lan Controller
2. 1 * SO-DIMM socket
3. H8 Keyboard Controller
4. SIM Card Slot
5. SiS962
6. LPC Super I/O (NSPC87393)
7. Cardbus (ENE1410)
8. Clock Generator
9. PCMCIA Power
10. Audio Codec (ALC201A)
11. TI1394 TSB43AB22

Mainboard Overview - Top

Cable Connectors

Figure 1 - 9
Mainboard Top Cable Connectors



1. JLVDS1 (Inverter Connector)
2. JGSMCON1 (Wireless Modem Connector)
3. JMDC1 (Modem Connector)
4. JLAN1 (Lan Connector)
5. JP1 (Power Connector connect to a DIP Switch)
6. JFAN1 (CPU Fan Connector)
7. JTP1 (TouchPad Connector)
8. JSPK2 (Speaker Connector)
9. JKB1 (Keyboard Connector)
10. JGSMMIC1 (Microphone Connector)
11. JSPK1 (Speaker Connector Battery Connector)
12. JBAT1 (CMOS Battery Connector)
13. JMIC1(Microphone Connector)

Mainboard Overview - Bottom

Cable Connectors

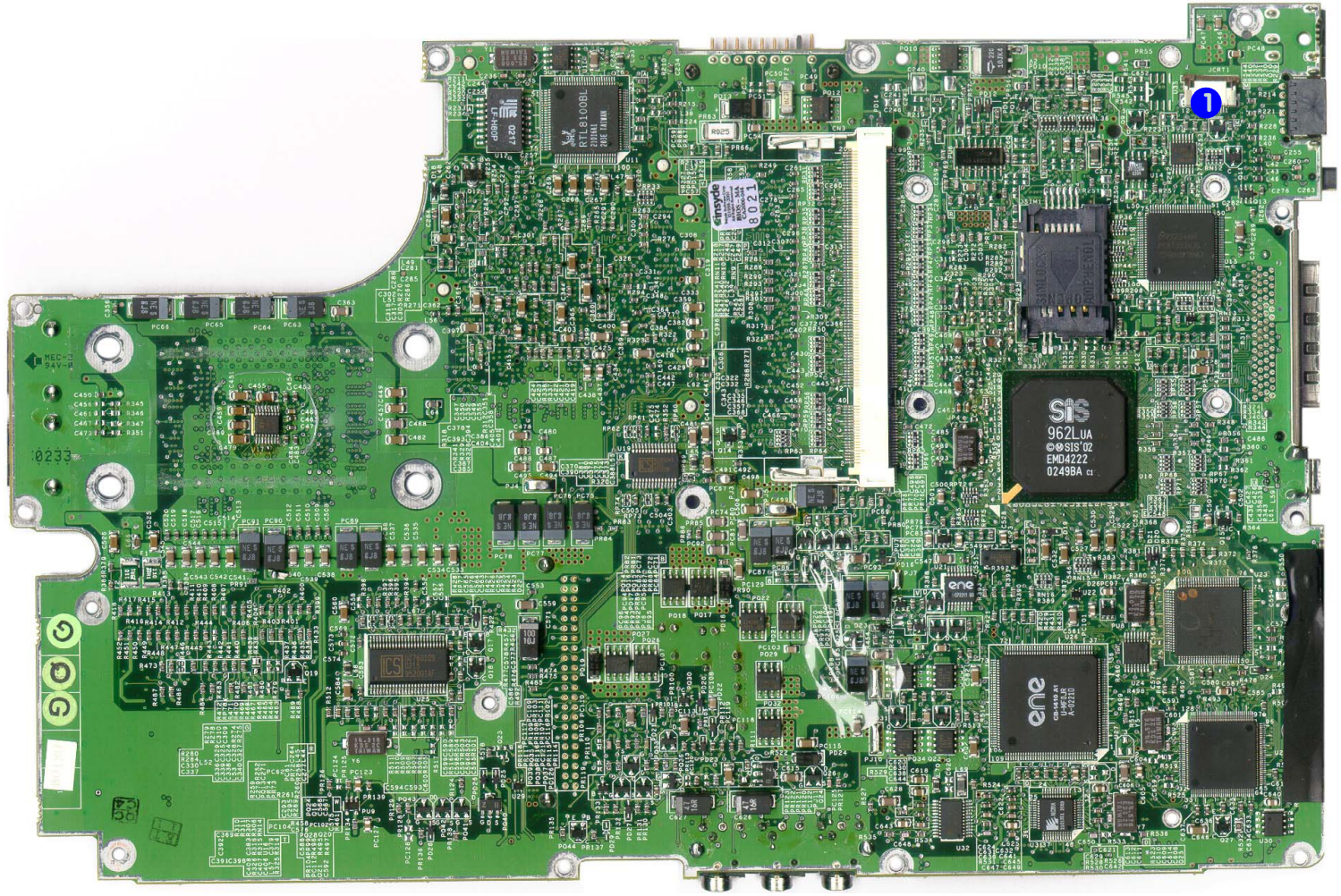


Figure 1 - 10
Mainboard Bottom Cable Connectors

1. JCRT1 (CRT Board Connector)

2: Disassembly

Overview

This chapter provides step-by-step instructions for disassembling parts and subsystems. When it comes to reassembly, reverse the procedures (unless otherwise indicated).

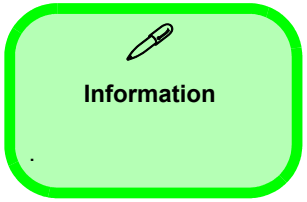
We suggest you completely review any procedure before you take the computer apart.

Procedures such as upgrading/replacing the RAM and hard disk are included in the User's Manual but are repeated here for your convenience.

To make the disassembly process easier each section may have a box in the page margin. Information contained under the figure # will give a synopsis of the sequence of procedures involved in the disassembly procedure. A box with a lists the relevant parts you will have after the disassembly process is complete. **Note**: The parts listed will be for the disassembly procedure listed ONLY, and not any previous disassembly step(s) required. Refer to the part list for the previous disassembly procedure. The amount of screws you should be left with will be listed here also.

A box with a will provide any possible helpful information. A box with a contains warnings.

An example of these types of boxes are shown in the sidebar.



NOTE: All disassembly procedures assume that the system is turned **OFF**, and disconnected from any power supply (the battery is removed too).

Maintenance Tools

The following tools are recommended when working on the notebook PC:

- M3 Philips-head screwdriver
- M2.5 Philips-head screwdriver (magnetized)*
- M2 Philips-head screwdriver
- Small flat-head screwdriver
- Pair of needle-nose pliers
- Anti-static wrist-strap

Connections

Connections within the computer are one of four types:

Locking collar sockets for ribbon connectors	To release these connectors, use a small flat-head screwdriver to gently pry the locking collar away from its base. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Pressure sockets for multi-wire connectors	To release this connector type, grasp it at its head and gently rock it from side to side as you pull it out. Do not pull on the wires themselves. When replacing the connection, do not try to force it. The socket only fits one way.
Pressure sockets for ribbon connectors	To release these connectors, use a small pair of needle-nose pliers to gently lift the connector away from its socket. When replacing the connection, make sure the connector is oriented in the same way. The pin1 side is usually not indicated.
Board-to-board or multi-pin sockets	To separate the boards, gently rock them from side to side as you pull them apart. If the connection is very tight, use a small flat-head screwdriver - use just enough force to start.

Maintenance Precautions

The following precautions are a reminder. To avoid personal injury or damage to the computer while performing a removal and/or replacement job, take the following precautions:

1. **Don't drop it**. Perform your repairs and/or upgrades on a stable surface. If the computer falls, the case and other components could be damaged.
2. **Don't overheat it**. Note the proximity of any heating elements. Keep the computer out of direct sunlight.
3. **Avoid interference**. Note the proximity of any high capacity transformers, electric motors, and other strong magnetic fields. These can hinder proper performance and damage components and/or data. You should also monitor the position of magnetized tools (i.e. screwdrivers).
4. **Keep it dry**. This is an electrical appliance. If water or any other liquid gets into it, the computer could be badly damaged.
5. **Be careful with power**. Avoid accidental shocks, discharges or explosions.
   - Before removing or servicing any part from the computer, turn the computer off and detach any power supplies.
   - When you want to unplug the power cord or any cable/wire, be sure to disconnect it by the plug head. Do not pull on the wire.
6. **Peripherals** – Turn off and detach any peripherals.
7. **Beware of static discharge**. ICs, such as the CPU and main support chips, are vulnerable to static electricity. Before handling any part in the computer, discharge any static electricity inside the computer. When handling a printed circuit board, do not use gloves or other materials which allow static electricity buildup. We suggest that you use an anti-static wrist strap instead.
8. **Beware of corrosion**. As you perform your job, avoid touching any connector leads. Even the cleanest hands produce oils which can attract corrosive elements.
9. **Keep your work environment clean**. Tobacco smoke, dust or other air-born particulate matter is often attracted to charged surfaces, reducing performance.
10. **Keep track of the components**. When removing or replacing any part, be careful not to leave small parts, such as screws, loose inside the computer.

Power Safety Warning

Before you undertake any upgrade procedures, make sure that you have turned off the power, and disconnected all peripherals and cables (including telephone lines). It is advisable to also remove your battery in order to prevent accidentally turning the machine on.

Cleaning

Do not apply cleaner directly to the computer, use a soft clean cloth.
Do not use volatile (petroleum distillates) or abrasive cleaners on any part of the computer.

Disassembly Steps

The following table lists the disassembly steps, and on which page to find the related information. **PLEASE PERFORM THE DISASSEMBLY STEPS IN THE ORDER INDICATED.**

To remove the battery:

1. Remove the battery *page 2 - 6*

To remove the hard disk drive assembly:

1. Remove the battery *page 2 - 6*
2. Remove the hard disk drive assembly *page 2 - 7*

To remove the system memory (socket 2):

1. Remove the battery *page 2 - 6*
2. Remove the memory (socket 2) *page 2 - 8*

To remove the keyboard:

1. Remove the battery *page 2 - 6*
2. Remove the keyboard *page 2 - 9*

To remove the system memory (socket 1):

1. Remove the battery *page 2 - 6*
2. Remove the keyboard *page 2 - 9*
3. Remove the memory (socket 1) *page 2 - 10*

To remove the CPU:

1. Remove the battery *page 2 - 6*
2. Remove the keyboard *page 2 - 9*
3. Remove the CPU *page 2 - 11*

To remove the modem:

1. Remove the battery *page 2 - 6*
2. Remove the keyboard *page 2 - 9*
3. Remove the modem *page 2 - 12*

To remove the GSM/CDMA modem:

1. Remove the battery *page 2 - 6*
2. Remove the keyboard *page 2 - 9*
3. Remove the GSM/CDMA modem *page 2 - 12*

To remove the LCD assembly:

1. Remove the battery *page 2 - 6*
2. Remove the hard disk drive assembly *page 2 - 7*
3. Remove the memory (socket 2) *page 2 - 8*
4. Remove the keyboard *page 2 - 9*
5. Remove the memory (socket 1) *page 2 - 10*
6. Remove the CPU *page 2 - 11*
7. Remove the modem *page 2 - 12*
8. Remove the GSM/CDMA modem *page 2 - 12*
9. Remove the LCD assembly *page 2 - 13*

To remove the mainboard and CRT board:

1. Remove the battery *page 2 - 6*
2. Remove the hard disk drive assembly *page 2 - 7*
3. Remove the memory (socket 2) *page 2 - 8*
4. Remove the keyboard *page 2 - 9*
5. Remove the memory (socket 1) *page 2 - 10*
6. Remove the CPU *page 2 - 11*
7. Remove the modem *page 2 - 12*
8. Remove the GSM/CDMA modem *page 2 - 12*
9. Remove the LCD assembly *page 2 - 13*
10. Remove the mainboard & CRT board *page 2 - 15*

To remove the inverter:

1. Remove the battery *page 2 - 6*
2. Remove the hard disk drive assembly *page 2 - 7*
3. Remove the memory (socket 2) *page 2 - 8*
4. Remove the keyboard *page 2 - 9*
5. Remove the memory (socket 1) *page 2 - 10*
6. Remove the CPU *page 2 - 11*
7. Remove the modem *page 2 - 12*
8. Remove the GSM/CDMA modem *page 2 - 12*
9. Remove the LCD assembly *page 2 - 13*
10. Remove the inverter *page 2 - 16*

To remove the LCD:

1. Remove the battery *page 2 - 6*
2. Remove the hard disk drive assembly *page 2 - 7*
3. Remove the memory (socket 2) *page 2 - 8*
4. Remove the keyboard *page 2 - 9*
5. Remove the memory (socket 1) *page 2 - 10*
6. Remove the CPU *page 2 - 11*
7. Remove the modem *page 2 - 12*
8. Remove the GSM/CDMA modem *page 2 - 12*
9. Remove the LCD assembly *page 2 - 13*
10. Remove the inverter *page 2 - 16*
11. Remove the LCD *page 2 - 17*

To remove the PCMCIA assembly:

1. Remove the battery *page 2 - 6*
2. Remove the hard disk drive assembly *page 2 - 7*
3. Remove the memory (socket 2) *page 2 - 8*
4. Remove the keyboard *page 2 - 9*
5. Remove the memory (socket 1) *page 2 - 10*
6. Remove the CPU *page 2 - 11*
7. Remove the modem *page 2 - 12*
8. Remove the GSM/CDMA modem *page 2 - 12*
9. Remove the LCD assembly *page 2 - 13*
10. Remove the mainboard & CRT board *page 2 - 15*
11. Remove the PCMCIA assembly *page 2 - 18*

Removing the Battery

1. Shut the computer down and turn it over.
2. Locate the battery release latches 1 and 2 (*Figure 2 - 1a*).
3. Latch 1 should slide to the right and remain in place, and you will need to hold latch 2 in place as you slide the battery out towards you.
4. Slide the battery out.

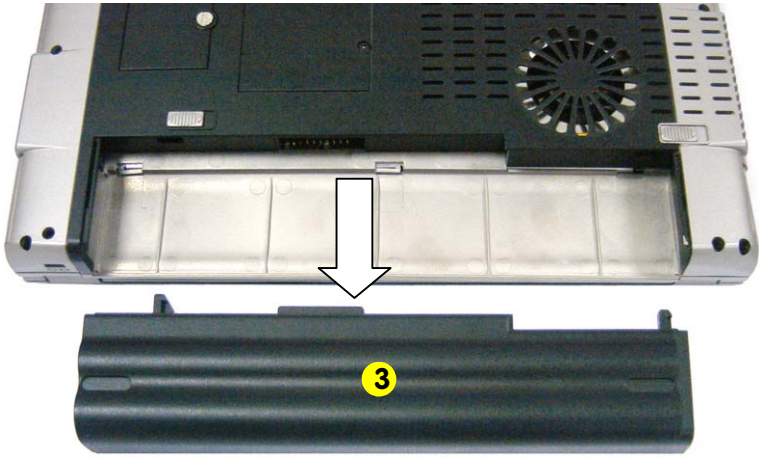
Figure 2 - 1
Battery Removal Sequence

a. Locate the battery release latches.
b. Slide latch 1 to the right, then slide and hold latch 2 to the right and hold.
c. Slide the battery out.

a.

b.

c.



3. Battery

Removing the Hard Disk Drive Assembly

1. Remove the battery (*page 2 - 6*) and turn the computer over.
2. Slide up the HDD assembly latch 1, and hold it in place.
3. Slide the HDD assembly 2 out of the computer (*Figure 2 - 2b*).
4. Place the HDD on a flat surface and remove screws 3 - 6, then carefully ease off the connector 7 (*Figure 2 - 2c*).

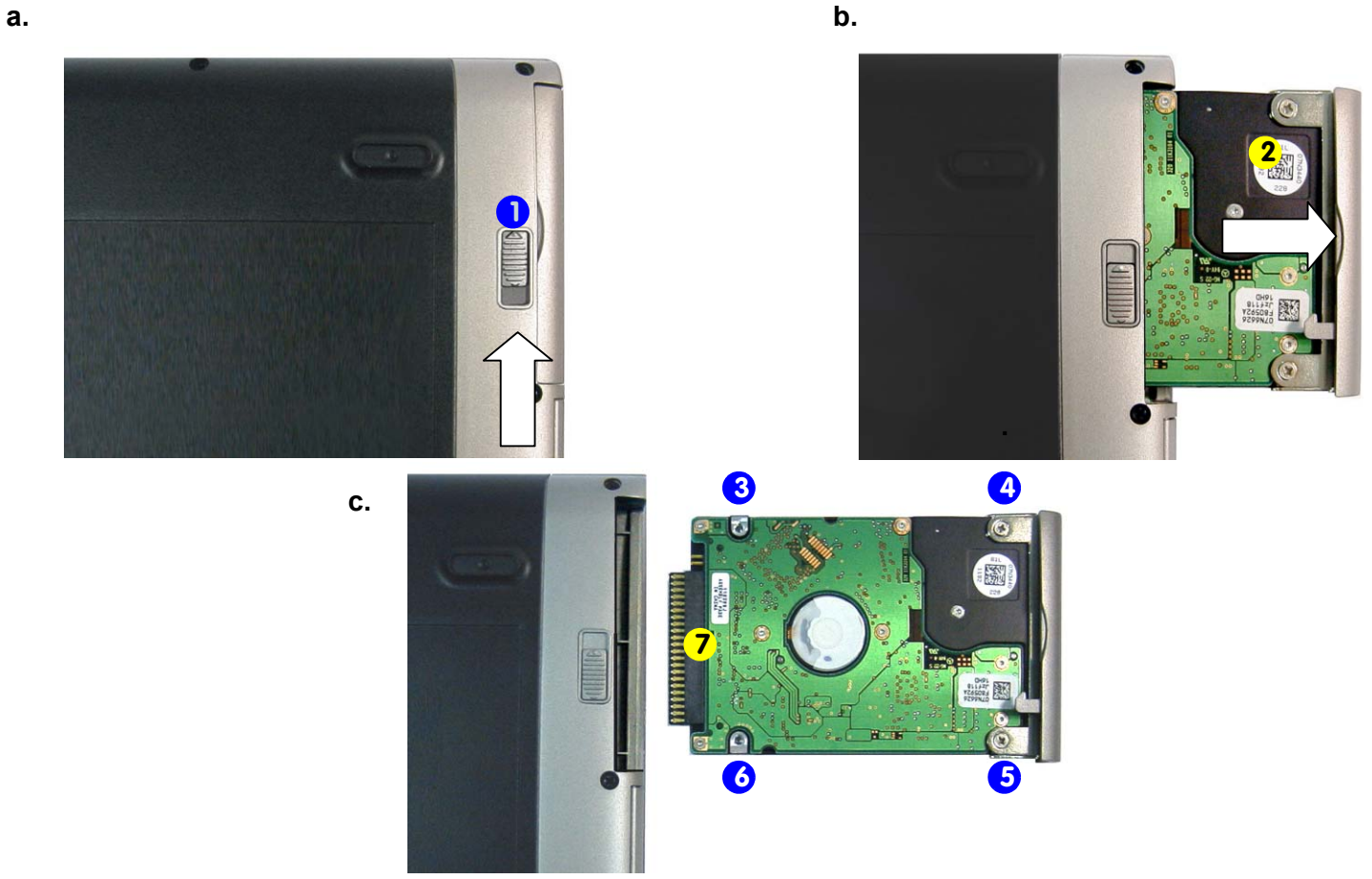


Figure 2 - 2
Hard Disk Removal Sequence

a. Slide the HDD assembly latch up and hold.
b. Slide the HDD assembly in the direction of the arrow.
c. Remove the screws and connector.

2. HDD
7. Connector

- 4 Screws

Figure 2 - 3
System Memory (Socket 2) Removal Sequence

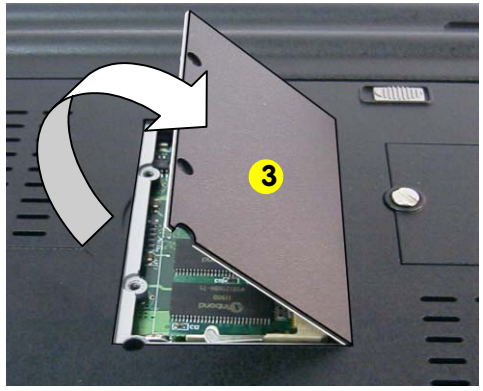
a. Remove screws 1 & 2.
b. Remove the cover.
c. Pull the latches in the direction indicated.
d. Release the module.

Removing the System Memory in Socket Two

1. Remove the battery (*page 2 - 6*) and turn the computer over.
2. Remove screws 1 & 2 (*Figure 2 - 3a*).
3. Lift the memory socket cover 3 off the computer (*Figure 2 - 3b*).
4. Locate the memory socket and carefully pull latches 4 and 5 (*Figure 2 - 5c*) on the memory socket in the direction indicated by the arrows in *Figure 2 - 5c*.
5. The module 6 (*Figure 2 - 5d*) will pop-up, and you can remove it.
6. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.

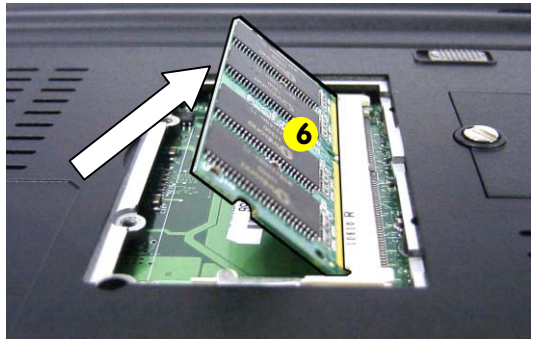
a.

b.



c.

d.



3. Socket Cover
6. Memory Module

- 2 Screws

Removing the Keyboard

1. Remove the battery (*page 2 - 6*).
2. Press the **three** keyboard latches at the top of the keyboard to elevate the keyboard from its normal position as in *Figure 2 - 4a* (you may need to use a small screwdriver to do this).
3. Lift the keyboard 5 (*Figure 2 - 4c*) up and out, being careful not to bend the ribbon cable 4 (*Figure 2 - 4b*).
4. Disconnect the keyboard ribbon cable from the locking collar socket.

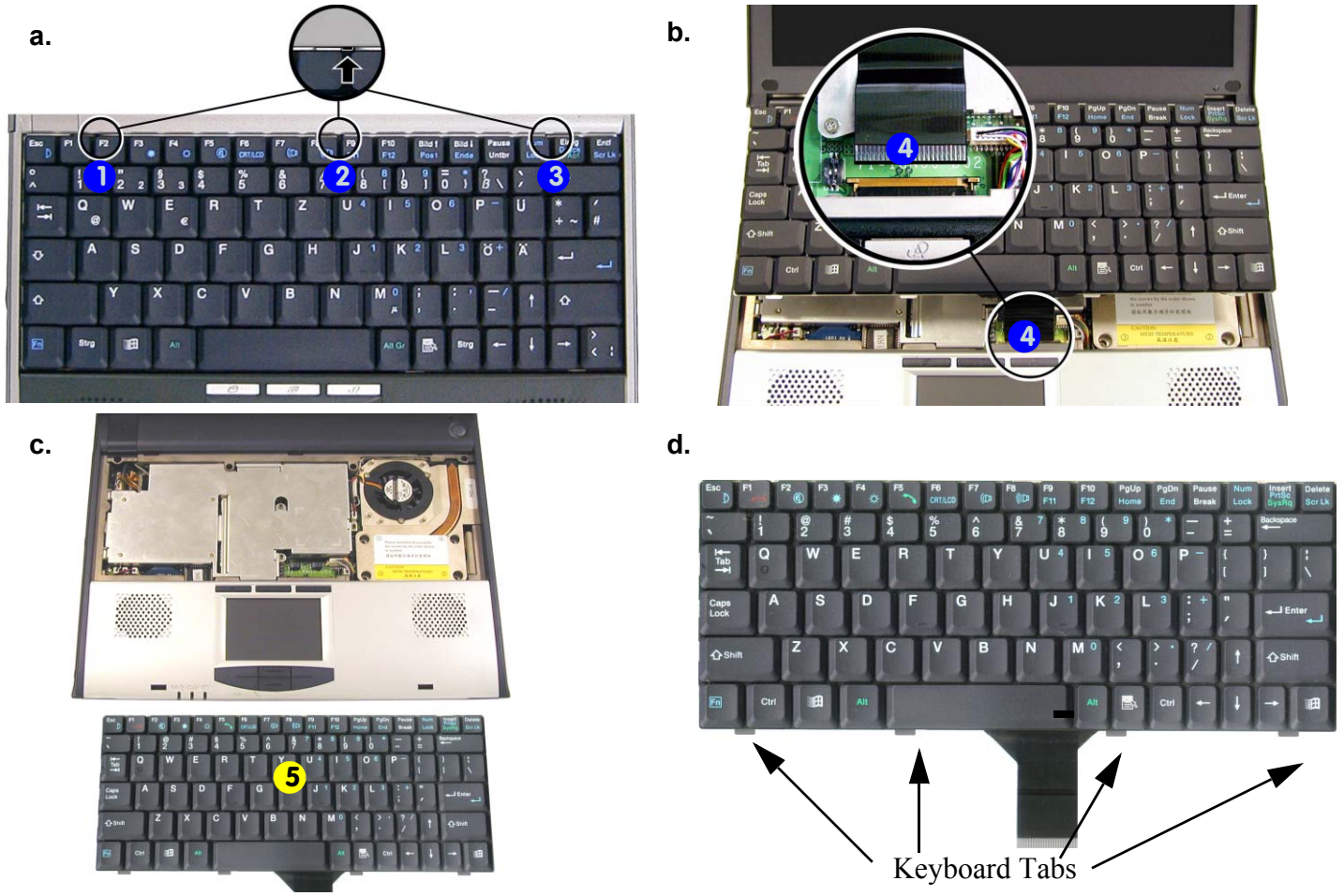


Figure 2 - 4
Keyboard Removal Sequence

a. Press the three latches to release the keyboard.
b. Lift the keyboard out.
c. Disconnect the cable from the locking collar.

Re-Inserting the Keyboard

When re-inserting the keyboard firstly align the **four** keyboard tabs (*Figure 2 - 4d*) at the bottom of the keyboard with the slots in the case.

4. Ribbon cable
5. Keyboard

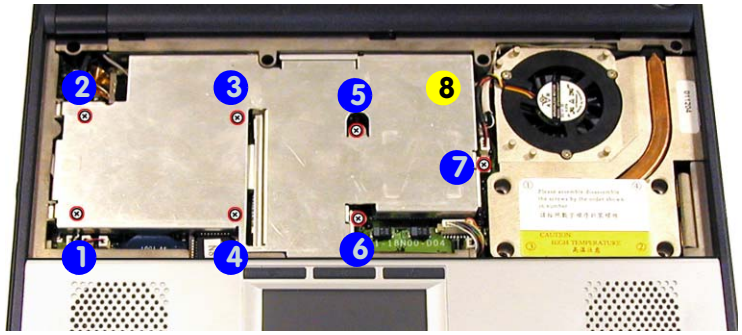
Figure 2 - 5
System Memory (Socket 1) Removal Sequence

a. Remove the screws from the shielding plate, and lift the shielding plate off the computer.
b. Pull the latches on the memory sockets to release the module.
c. When the module pops up, lift it out.

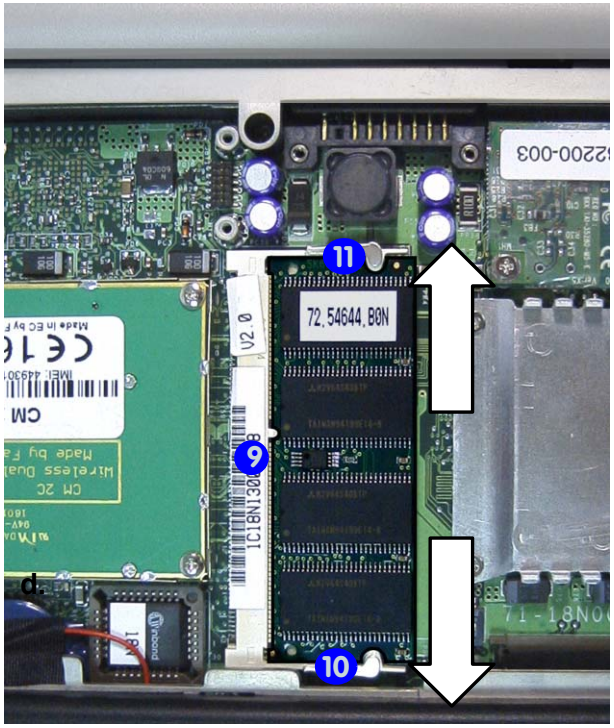
Removing the System Memory in Socket One

1. Remove the battery (*page 2 - 6*) and keyboard (*page 2 - 9*).
2. Remove screws 1 - 7 (*Figure 2 - 5a*) from the shielding plate 8, and lift the plate up off the computer.
3. Locate the memory socket 9 and gently pull latches 10 and 11 on the memory socket in the direction of the arrows, as indicated in *Figure 2 - 5b*.
4. The module 12 (*Figure 2 - 5c*) will pop-up, and you can remove it.
5. Insert a new module holding it at about a 30° angle and fit the connectors firmly into the memory slot.

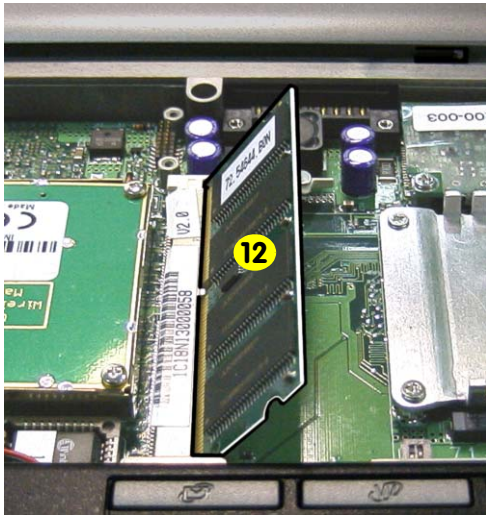
a.



b.



c.



d.

8. Shielding plate
12. Memory module

- 7 Screws

Contact Warning

Be careful not to touch the metal pins on the module's connecting edge. Even the cleanest hands have oils which can attract particles, and degrade the module's performance.

Removing the CPU

1. Remove the battery (*page 2 - 6*) and keyboard (*page 2 - 9*).
2. Remove screws 1 - 4 (*Figure 2 - 6a*) from the heat sink in the order indicated (when inserting a new or replacement CPU, make sure you insert the screws in the same order indicated in *Figure 2 - 6a*).
3. Disconnect the fan cable 5 and slide the heat sink 6 slightly to the left, then lift the heat sink out of the computer.
4. Use a small screwdriver to release the lock holding down the CPU by giving it a counter-clockwise turn towards the open symbol.
5. Remove the CPU 7.

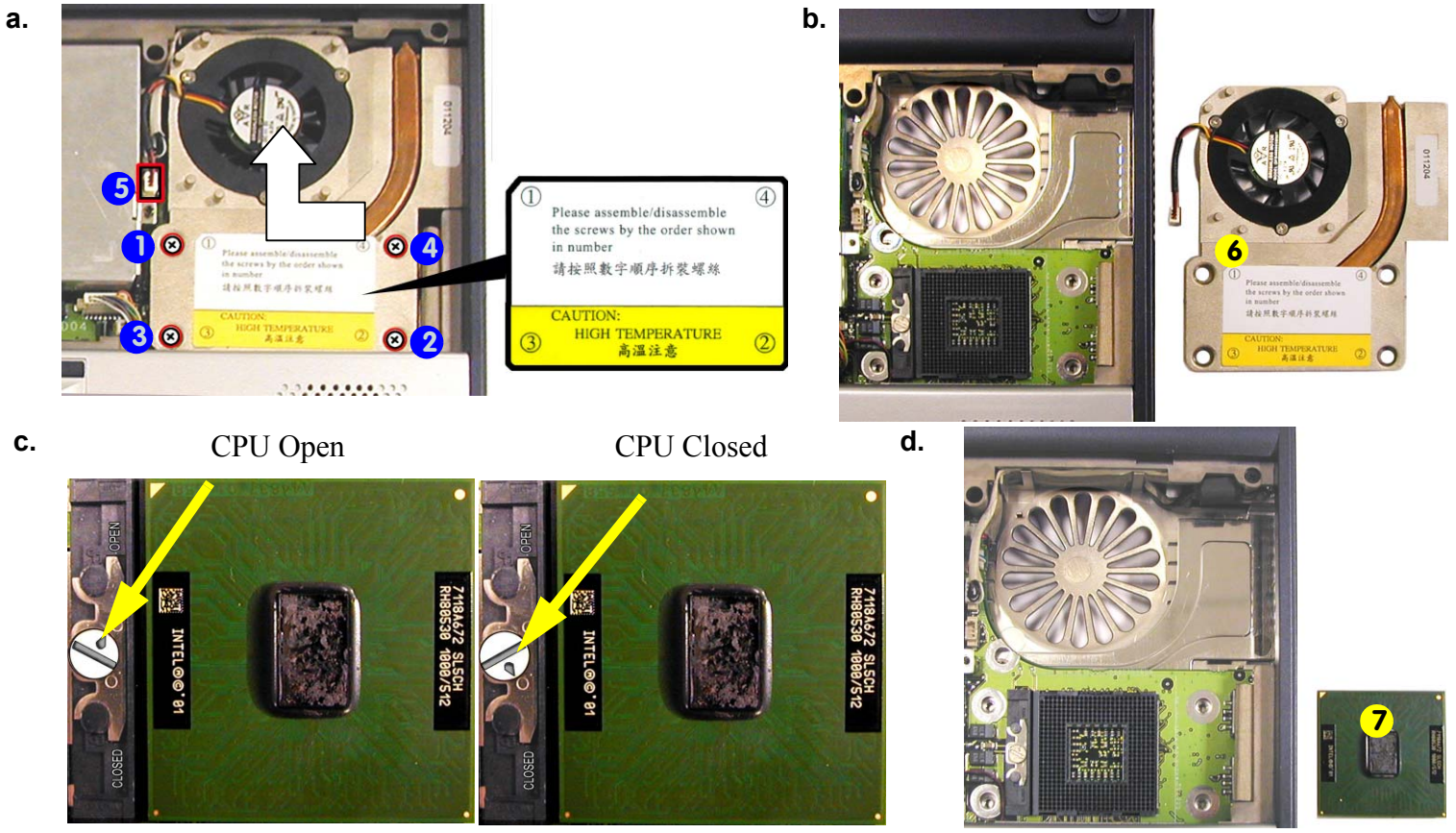


Figure 2 - 6
Processor Removal Sequence

a. Remove the four screws and fan connector.
b. Remove the heat sink.
c. Unlock the CPU.
d. Remove the CPU.

Caution

The heat sink, and CPU area in general, contains parts which are subject to high temperatures - Please allow the area time to cool before removing these parts.

6. Heat Sink
7. CPU

- 4 Screws

Removing the Modem

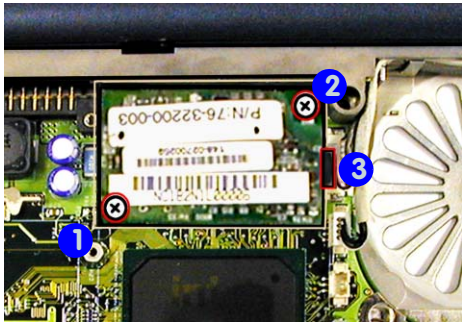
1. Remove the battery (*page 2 - 6*), keyboard (*page 2 - 9*) and shielding plate (*Figure 2 - 5a* on *page 2 - 10*).
2. Remove screws 1 - 2 (*Figure 2 - 7a*) from the modem and disconnect the modem cable 3.
3. Remove the modem 4.

Figure 2 - 7
Modem Removal Sequence

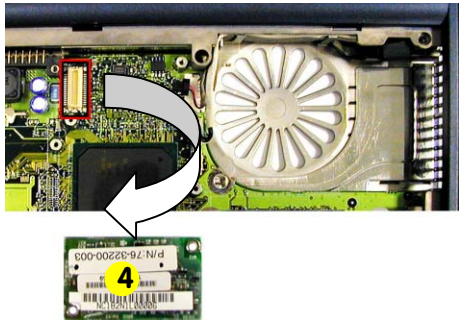
a. Remove the two screws and disconnect the modem cable.
b. Remove the modem.

4. Modem
- 9 Screws (incl. shielding plate)

a.



b.



Removing the GSM/CDMA Modem

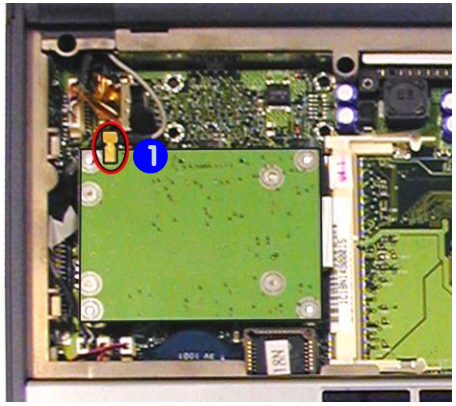
1. Remove the battery (*page 2 - 6*), keyboard (*page 2 - 9*) and shielding plate (*Figure 2 - 5a* on *page 2 - 10*).
2. Disconnect the GSM modem cable 1 (*Figure 2 - 7a*).
3. Remove the GSM modem 2.

Figure 2 - 8
GSM Modem Removal Sequence

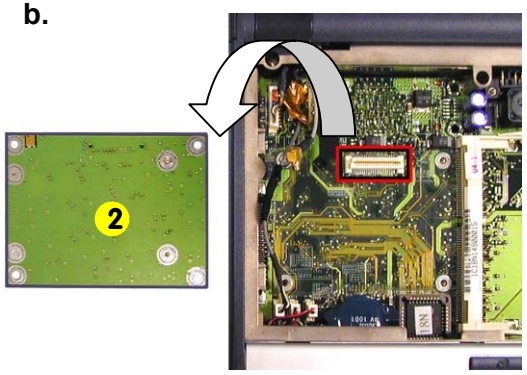
a. Disconnect the GSM modem cable.
b. Remove the GSM modem.

2. GSM Modem
- 7 Screws (incl. shielding plate)

a.



b.



Removing the LCD Assembly

1. Remove the battery (*page 2 - 6*), HDD (*page 2 - 7*), keyboard (*page 2 - 9*), system memory (*page 2 - 8* & *page 2 - 10*), CPU (*page 2 - 11*) and modems (*page 2 - 12*).
2. Turn the computer over and remove screws 1 - 13 (*Figure 2 - 9*) from the bottom of the computer.

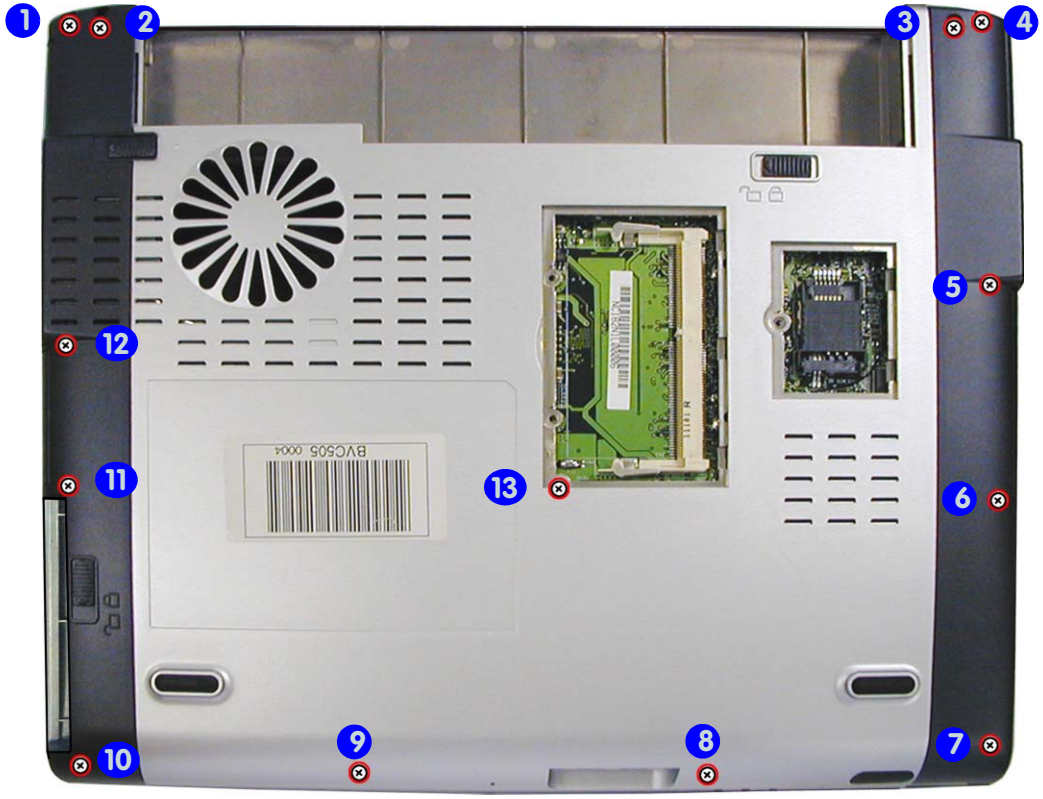


Figure 2 - 9
LCD Assembly Removal Sequence

Remove the thirteen screws from the bottom of the computer.

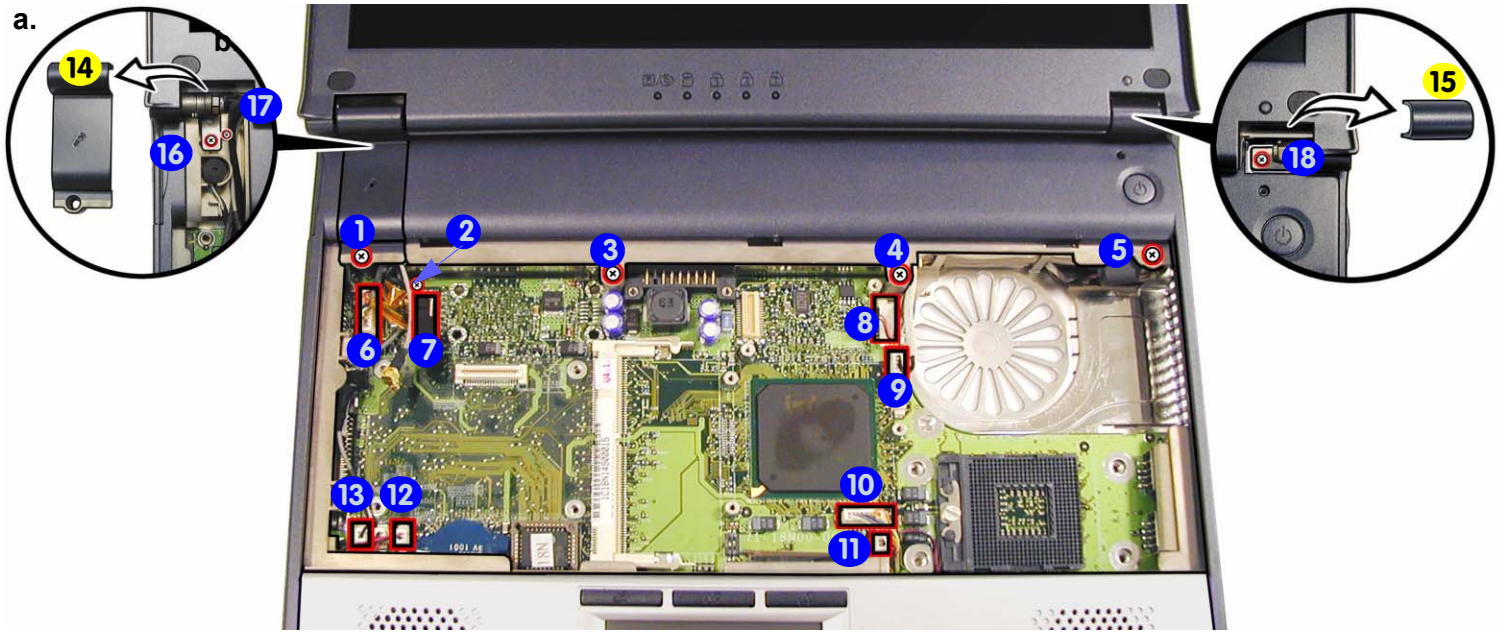
- 13 Screws

Figure 2 - 10
LCD Assembly Removal Sequence (Cont'd)

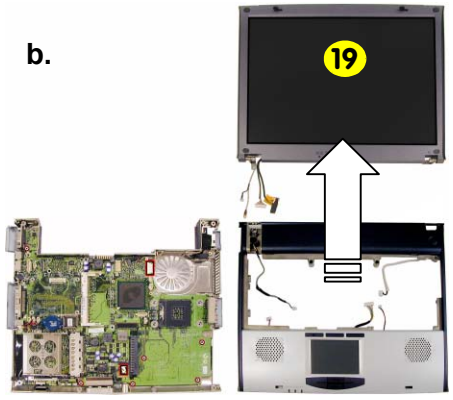
a. Disconnect the cables, and remove the 5 screws. Push the LCD back and remove the hinge covers, and 3 screws.
b. Lift the LCD assembly off the bottom case.

3. Remove screws 1 - 5 and disconnect cables 6 - 13 (*Figure 2 - 10a*) from the mainboard.
4. Push the LCD back as far as it will go and carefully remove the left 14 and right 15 hinge covers.
5. Remove the **2** screws 16 & 17 from under the left hinge cover, and screw 18 from under the right hinge cover.
6. Carefully remove the LCD 19 from the computer (*Figure 2 - 10b*).

a.



b.



14. Left Hinge Cover
15. Right Hinge Cover
19. LCD

- 8 Screws

Removing the Mainboard and CRT board

1. Remove the battery (*page 2 - 6*), HDD (*page 2 - 7*), keyboard (*page 2 - 9*), system memory (*page 2 - 8* & *page 2 - 10*), CPU (*page 2 - 11*), modems (*page 2 - 12*) and LCD assembly (*page 2 - 13*).
2. Ensure you have removed all the screws and disconnected the cables as part of the process of removing the LCD.
3. Carefully lift the top case module 1 up off the bottom case and mainboard assembly (*Figure 2 - 11a*).
4. Disconnect cables 2 & 3 (you may have already disconnected cable 2) and remove screws 4 - 9 (*Figure 2 - 11b*).
5. Separate the mainboard and CRT board assembly 10 from the bottom case 11.
6. Turn the mainboard over and disconnect the cable 12, which connects the mainboard to the CRT board 13, in order to separate the boards.

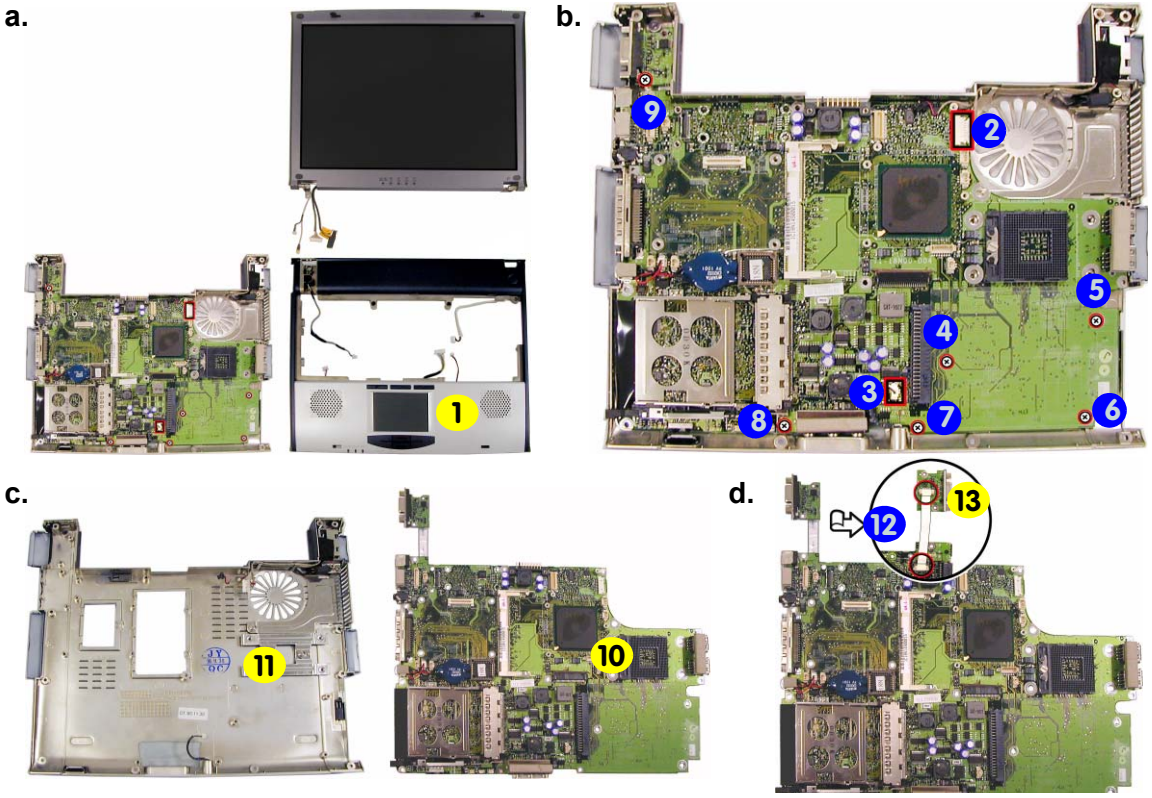


Figure 2 - 11
Mainboard & CRT Board Removal Sequence

a. Lift the top case module off the bottom case and mainboard assembly.
b. Disconnect the cables and remove the screws.
c. Separate the mainboard and CRT board assembly from the bottom case.
d. Turn the board over and disconnect the cable to separate the boards.

1. Top case module
10. Mainboard
11. Bottom case module
12. CRT board

- 6 Screws

Figure 2 - 12
Inverter Removal Sequence

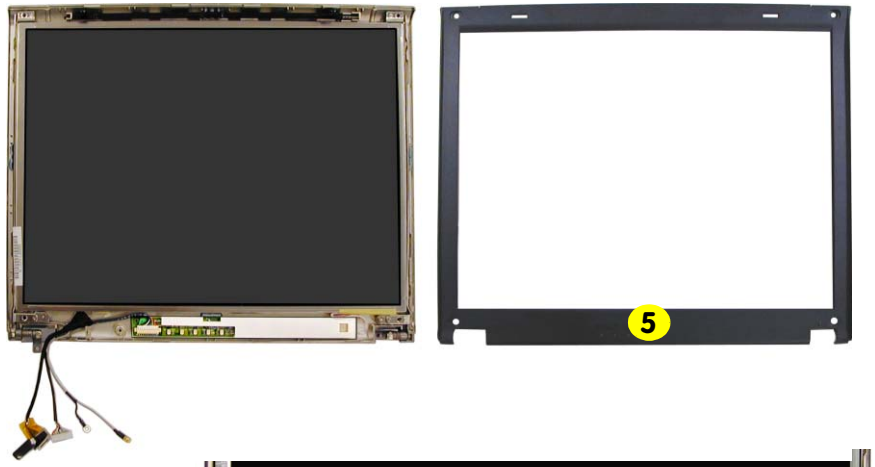
a. Remove the screws.
b. Unsnap the LCD front panel from the back.
c. Disconnect the cable from the inverter.
d. Separate the inverter and cover.

Removing the Inverter

1. Remove the battery (*page 2 - 6*), HDD (*page 2 - 7*), keyboard (*page 2 - 9*), system memory (*page 2 - 8* & *page 2 - 10*), CPU (*page 2 - 11*), modems (*page 2 - 12*) and LCD assembly (*page 2 - 13*).
2. Remove the rubber covers and screws 1 - 4 from the LCD (*Figure 2 - 12a*).
3. Run your finger around the middle of the frame to carefully unsnap the LCD front panel module 5 from the back (*Figure 2 - 12b*).
4. Disconnect the cable at point 6 from the inverter (*Figure 2 - 12c*).
5. Lift the inverter off the LCD assembly and separate the inverter 7 and mylar cover 8 (*Figure 2 - 12d*).

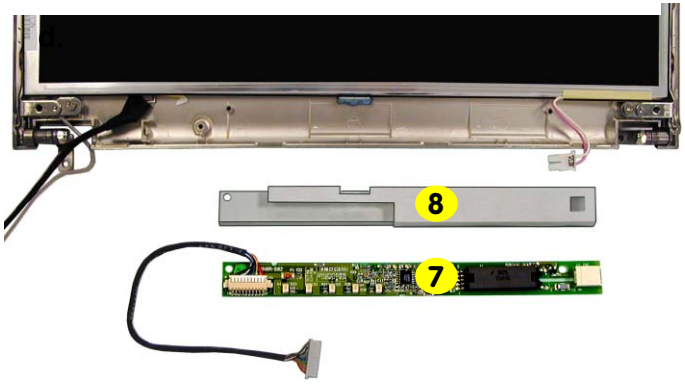
a.

b.



c.

d.



5. LCD front panel
7. Inverter
8. Mylar cover

- 4 Screws

Removing the LCD

1. Remove the battery (*page 2 - 6*), HDD (*page 2 - 7*), keyboard (*page 2 - 9*), system memory (*page 2 - 8* & *page 2 - 10*), CPU (*page 2 - 11*), modems (*page 2 - 12*), LCD assembly (*page 2 - 13*) and inverter (*page 2 - 16*).
2. Lift the LCD assembly off the back panel module 1 (*Figure 2 - 13a*).
3. Remove screws 2 - 5 from the LCD assembly (*Figure 2 - 13b*).
4. Separate the LCD 6 from the left 7 and right 8 brackets (*Figure 2 - 13b*).

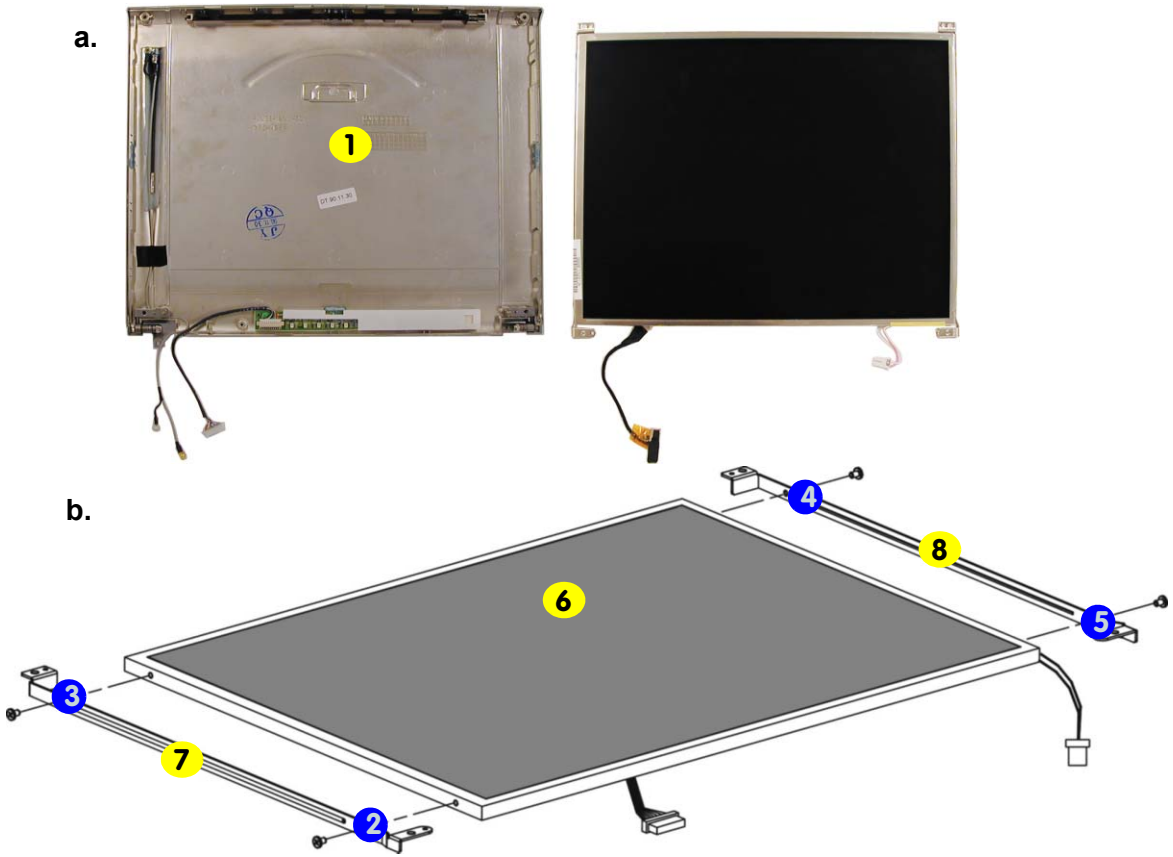


Figure 2 - 13
LCD Removal Sequence

a. Lift the LCD assembly off the back panel.
b. Remove the four screws and separate the LCD from the brackets.

1. Back panel module
6. LCD
7. Left bracket
8. Right bracket

- 4 Screws

Figure 2 - 14
PCMCIA Assembly Removal Sequence

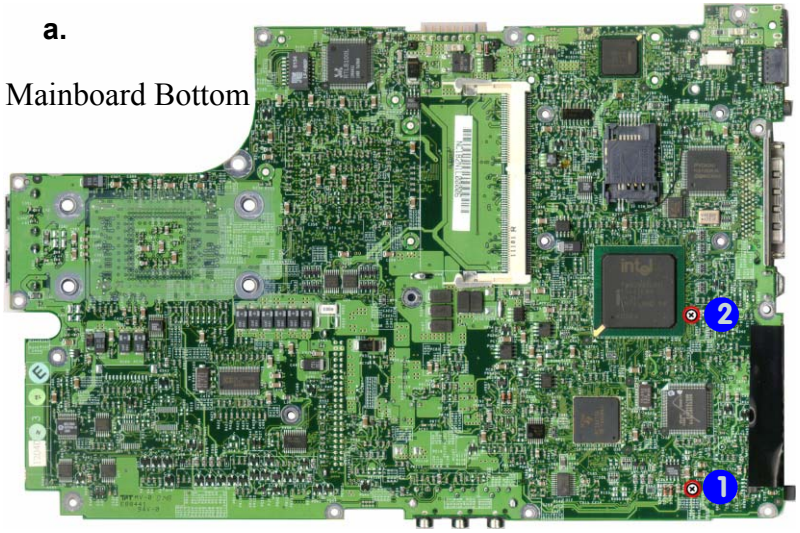
a. Remove the screws.
b. Carefully release the PCMCIA assembly from the pins.
c. Remove the PCMCIA assembly.

Removing the PCMCIA Assembly

1. Remove the battery (*page 2 - 6*), HDD (*page 2 - 7*), keyboard (*page 2 - 9*), system memory (*page 2 - 8* & *page 2 - 10*), CPU (*page 2 - 11*), modems (*page 2 - 12*), LCD assembly (*page 2 - 13*) and mainboard (*page 2 - 15*).
2. Turn the mainboard over to access the bottom and remove screws 1 & 2 (*Figure 2 - 14a*).
3. Turn the mainboard back over and use a pair of tweezers or small screwdriver to carefully push the metal assembly off the plastic pins at points 3 & 4 (*Figure 2 - 14b*).
4. Remove the PCMCIA assembly 5 from the mainboard (*Figure 2 - 14c*).

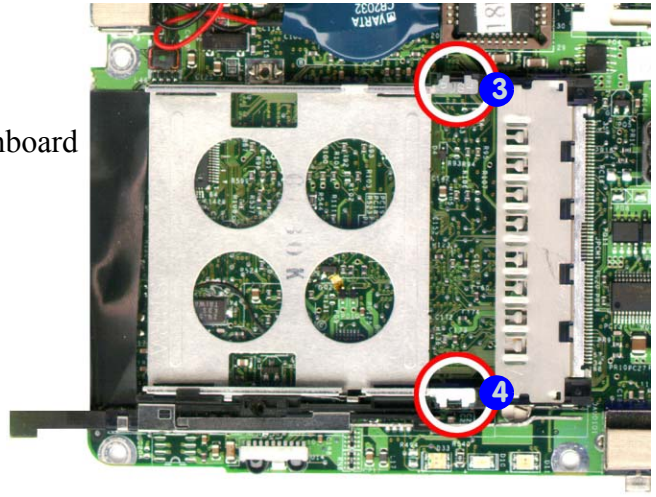
a.

Mainboard Bottom

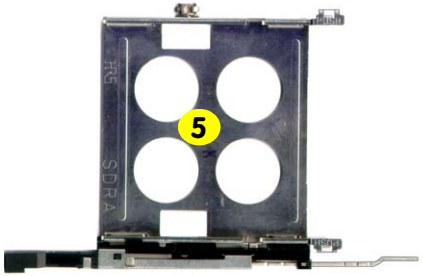


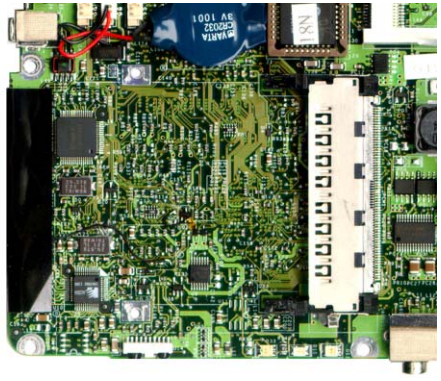
b.

Mainboard Top



c.





5. PCMCIA assembly
- 2 Screws

Appendix A:Part Lists

This appendix breaks down the notebook PC's construction into a series of illustrations. The component part numbers are indicated in the tables opposite the drawings.

Note: This section indicates the *manufacturer's* part numbers. Your organization may use a different system, so be sure to cross-check any relevant documentation.

Note: Some assemblies may have parts in common (especially screws). However, the part lists DO NOT indicate the total number of duplicated parts used.

Note: Be sure to check any update notices. The parts shown in these illustrations are appropriate for the system at the time of publication. Over the product life, some parts may be improved or re-configured, resulting in *new* part numbers.

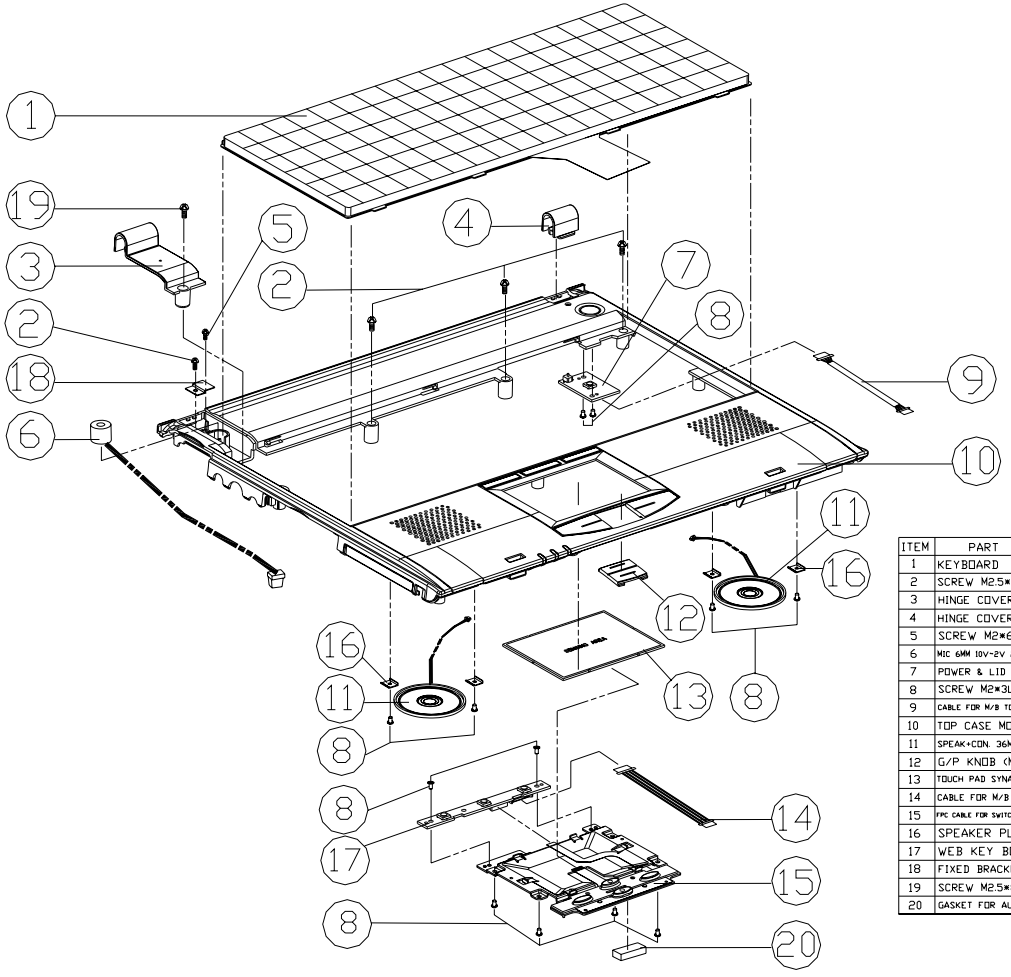
Part List Illustration Location

The following table indicates where to find the appropriate part list illustration.

Table 1 - 1
Part List Illustration Location

Part	M190S	M192S
Top	*page A - 3*	*page A - 11*
Bottom	*page A - 4*	*page A - 12*
LCD	*page A - 5*	*page A - 13*
Combo - CDRW-CD	*page A - 6*	*page A - 14*
Combo - CDRW-DVD	*page A - 7*	*page A - 15*
Combo - FDD-CD	*page A - 8*	*page A - 16*
Combo - FDD-CDRW	*page A - 9*	*page A - 17*
Combo - FDDT-DVDQ	*page A - 10*	*page A - 18*

Top (M190S)



ITEM	PART NAME	PART NO	REMARK
1	KEYBOARD	80-18N08-7G0	
2	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
3	HINGE COVER(L)	42-18N72-022	
4	HINGE COVER(R)	42-18N72-011	
5	SCREW M2*6L P BZ ICT NY	35-06120-6RA	
6	MIC 6MM 10V-2V 2.2K (120MM) W/CABLE	23-E0610-22J	
7	POWER & LID SWITCH BOARD	77-18N0S-D0X	
8	SCREW M2*3L K1 NI ICT NY	35-B1120-3RA	
9	CABLE FOR M/B TO POWER & LID SWITCH	43-18N0S-010	
10	TOP CASE MODULE	39-18N02-017	
11	SPEAK+CON. 36MM 1W 80MM 180DN	23-53610-800	
12	G/P KNOB (M)	42-18N82-052	
13	TOUCH PAD SYNAPTICS TM41PDG351-1	49-42002-010	
14	CABLE FOR M/B TO WEB KEY BOARD	43-18N0W-010	
15	FPC CABLE FOR SWITCH WITH G/P HOLDER MODULE	43-18N01-013	
16	SPEAKER PLATE	33-18N0T-010	
17	WEB KEY BOARD	77-M190W-D0X	
18	FIXED BRACKET FOR CABLE	33-18N03-040	
19	SCREW M2.5*8 P CZ ICT	35-03125-8R0	
20	GASKET FOR AUDIO (W6*L35*6.5t)	47-00190-183	

Figure 1
Top (M190S)

Bottom (M190S)

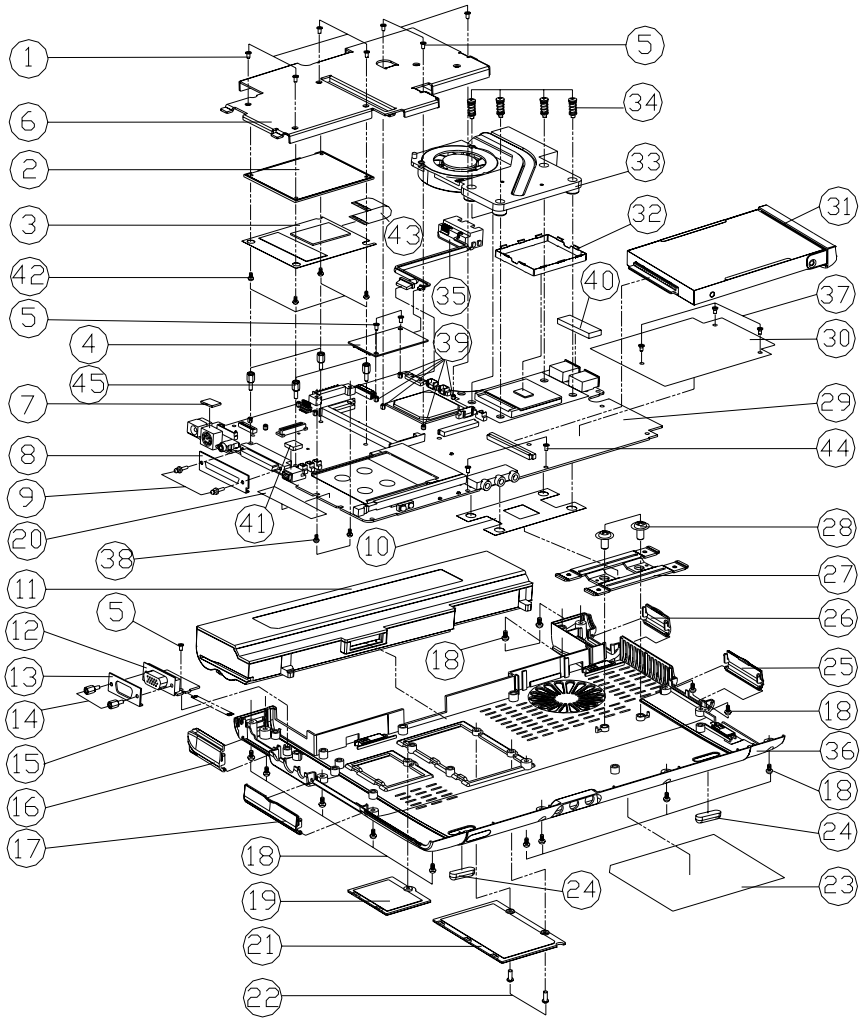
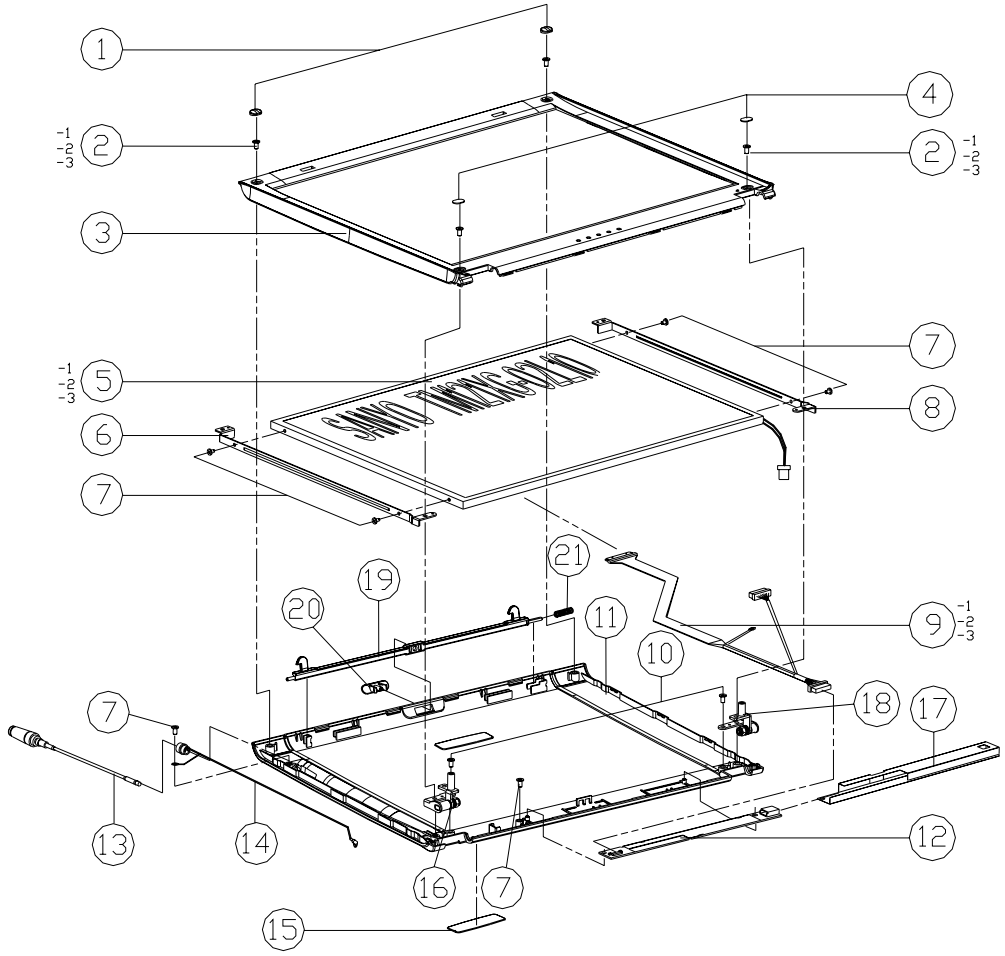


Figure 2
Bottom (M190S)

ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*5L F BZ ICT	35-22120-5R0	
2	GPRS BOARD V06.0	77-18N0I-D06	
3	MC35 GPRS MODULE	88-18N61-270	
4	MDC MODEM	76-32200-003	
5	SCREW M2*4L K1 BNI ICT	35-B9120-4R0	
6	CHIP HEAT SINK	31-18N0N-010	
7	GASKET FOR PS2 (W7*L12*1t)	47-00190-1K1	
8	I/O BRACKET	33-18N0S-010	
9	SCREW FOR HONDA 68P	21-14D00-417-S	
10	CPU SUPPORTOR MYLAR	40-18N5N-010	
11	BAT.P S.L.I. 3S2P 11.1V 3600mAH(SMP/PANASONIC)	87-18N8S-4CC	Reference Ass'y Bom (99-18N05-050)
11	BAT.P S.L.I. 3S2P 11.1V 3600mAH(GLW/PANASONIC)	87-18N8S-45C	Reference Ass'y Bom (99-18N05-050)
12	CRT BOARD	77-M190H-D0X	
13	CRT BRACKET	33-18N0S-020	
14	HEX STUD (SUM22 NI-PL) 11mm	34-07009-011-A	
15	CABLE FOR M/B TO CRT BOARD FCC 12PIN	43-18N0H-010	
16	CRT COVER	42-18N73-030	
17	1394 COVER	42-18N73-040	
18	SCREW M2.5*6L K BZ ICT	35-82125-6R0	
19	SIM COVER+SCREW MODULE	42-18N73-103	
20	MYLAR FOR PCMCIA	40-32004-000	
21	DIMM COVER	42-18N73-013	
22	SCREW M2*4L P BN ICT	35-09120-4R0	
23	PRODUCT LABEL FOR 1800N	45-18N03-010	
24	BOTTOM CASE RUBBER PAD	47-18N23-010	
25	UBS COVER	42-18N73-050	
26	LAN COVER	42-18N73-020	
27	CPU SUPPORTOR	33-18N03-011	
28	SCREW M2.5*2.5L B NI ICT W/WAS NY	35-41025-2R5	
29	MAIN BOARD	77-M1900-D0X	
30	HDD MYLAR	40-18N0I-011	
31	W/O HDD ASS'Y 1800N	79-18N21-010	Reference Ass'y Bom (99-18N05-040)
32	SPRING PLATE	38-18N0S-010	
33	HEAT SINK MODULE M190S	31-M190N-100	
34	SCREW B NI ICT M2.5*12L SCREW=2	35-41125-12A	
35	CABLE FOR M/B TO MDC & LAN (WIRE 2+8PIN)	43-18N0Z-011	
36	BOTTOM CASE MODULE	39-18N03-014	
37	SCREW M2.0*3L F NI ICT NY	35-21120-3RA	
38	SCREW M2*6L P BZ ICT NY	35-06120-6RA	
39	HEX.STUD 5.0mm F=M2 M=NONE SN	34-P2T0S-010	
40	GASKET FOR USB (W9*L33*3.5t)	47-00190-331	
41	GASKET FOR 1394 (W7*L10*2t)	47-00190-011	
42	SCREW M2*3L B NI ICT NY	35-41120-3RA	
43	FFC FIAT CABLE 40PINS 31+-2MM PITCH 0.5MM	43-18N0G-020	
44	SCREW M2*3L K1 NI ICT NY	35-B1120-3RA	
45	HEX STUD H=7mm M=M2.5 WHITE NY	34-18N0S-030	

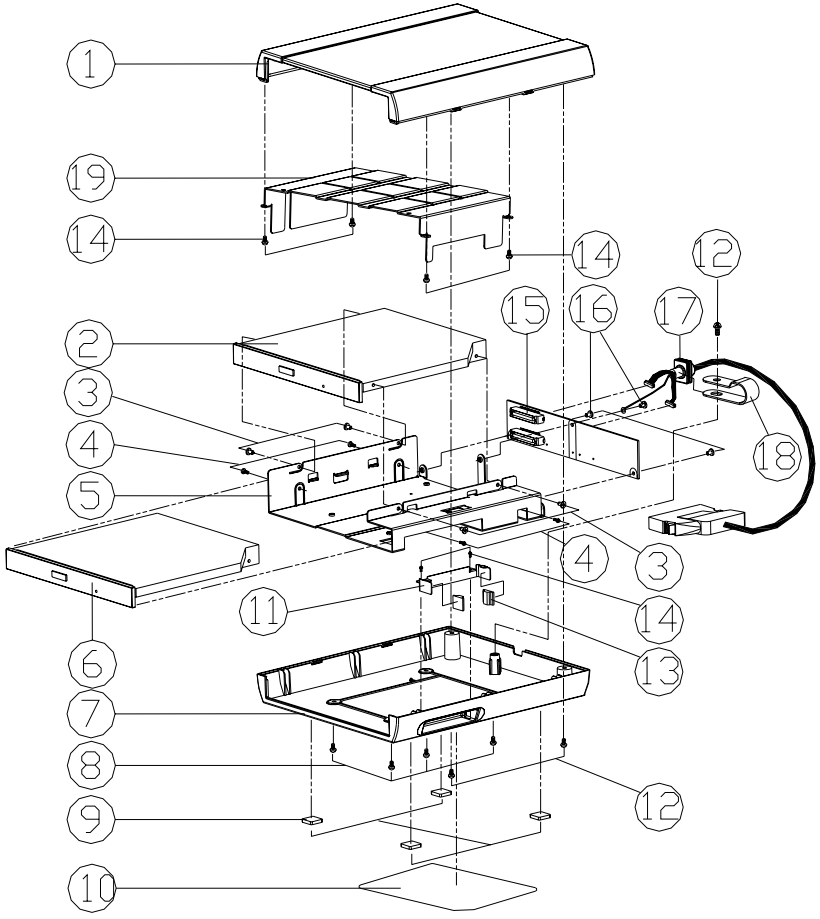
LCD (M190S)



ITEM	PART NAME	PART NO	REMARK
1	DISPLAY RUBBER PAD(UP)	47-18N21-011	
2 -1-2-3	SCREW M2.5*6L K1 BZ ICT	35-82125-6R0	
3	FRONT PANEL MODULE	39-18N01-011	
4	DISPLAY RUBBER PAD(BOTTOM)	47-18N21-020	
5-1	LCD 12.1" XGA TFT	50-F2255-M00	SAMSUNG LTN121XL-L
5-2	LCD 12.1" XGA TFT	50-F2255-H00	HYUNDAI HT12X12-10
5-3	LCD 12.1" XGA TFT	50-F2253-L00	LG LP121X1-A2(C2)
6	LCD BRACKET FOR SAMSUNG (L)	33-18N01-040	
7	SCREW M2*2.5L K1 BZ ICT NY Ø4	35-B6120-2RF	
8	LCD BRACKET FOR SAMSUNG (R)	33-18N01-030	
9-1	COAXIAL CABLE FOR M/B TO LCD	43-18N01-034	SAMSUNG LTN121XL-L
9-2	COAXIAL CABLE FOR M/B TO LCD	43-18N01-053	HYUNDAI HT12X12-10
9-3	COAXIAL CABLE FOR M/B TO LCD	43-18N01-034	LG(LP121X1-A2(C2))
10	SCREW M2.5*4L K NI ICT NY	35-B1125-4RA-A	
11	BACK PANEL MODULE	39-18N01-022	
12	INVERTER BOARD	77-M190R-D0X	
13	GSM ROD ANTENNA 900/1800	23-73900-001	
14	GSM ANTENNA CABLE 30CM/1.5MM DIA	43-18N0G-011	
15	NAME PLATE "NOTEBOOK"	45-18N01-010	
16	HINGE(L)	33-18N01-011	
17	INVERTER MYLAR	40-18N5R-011	
18	HINGE(R)	33-18N01-021	
19	LCD HOOK	42-18NA1-010	
20	LCD KNOB	42-18N81-011	
21	SPRING FOR HOOK (Ø3.7*15*0.3d)	38-21P30-011	

Figure 3
LCD (M190S)

Combo Drive - CDRW-CD (M190S)



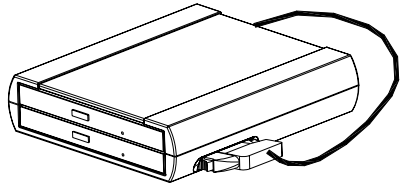
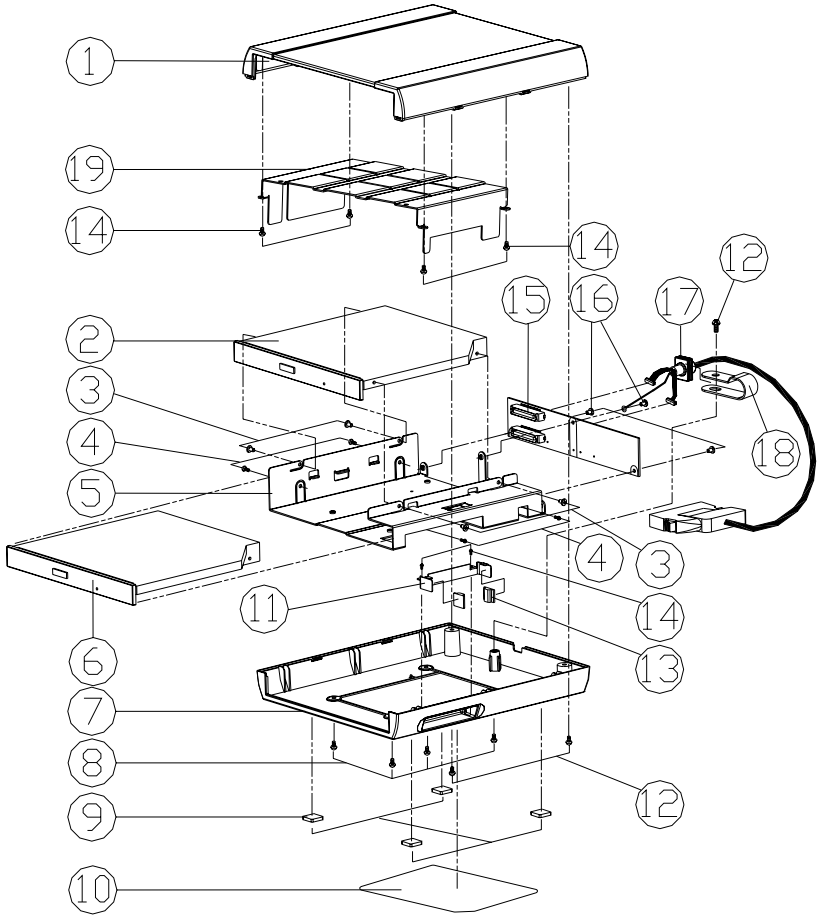
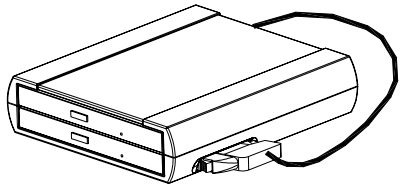


Figure 4
Combo Drive CDRW-CD (M190S)

ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-18N0J-0121	
2	CD-ROM 5 1/4" 24X SN-124 SAMSUNG	85-607□X-S00	
3	SCREW M2.5*3L K1 BK/□. NY	35-B4125-3RA	
4	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
5	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
6	CD-RW 5 1/4" 8X UJDA330CL-Z 12.7mm KME	85-8078X-K00	
7	COMBO BOTTOM CASE	42-18N0Z-012	
8	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
9	COMBO FOOT PAD	47-18N1Z-010	
10	PRODUCT LABEL FOR CD-RW/CD-ROM 1800N	45-18N0C-040	
11	RUBBER BRACKET	33-18N0Z-010	
12	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
13	CONNECTOR RUBBER	47-18N2Z-010	
14	SCREWØ2*5L P NI TAP	35-01720-5R0	
15	COMBO BOARD CD-ROM/CD-ROM	77-18N0J-D04	
16	SCREW M2*3L B NI ICT NY	35-41120-3RA	
17	CABLE FOR M/B TO COMBO BOARD CDROM/FDD	43-18N0J-010	
18	CABLE CLIP	33-18N03-020	
19	ENHANCE BRACKET	33-18N0C-010	

Combo Drive - CDRW-DVD (M190S)



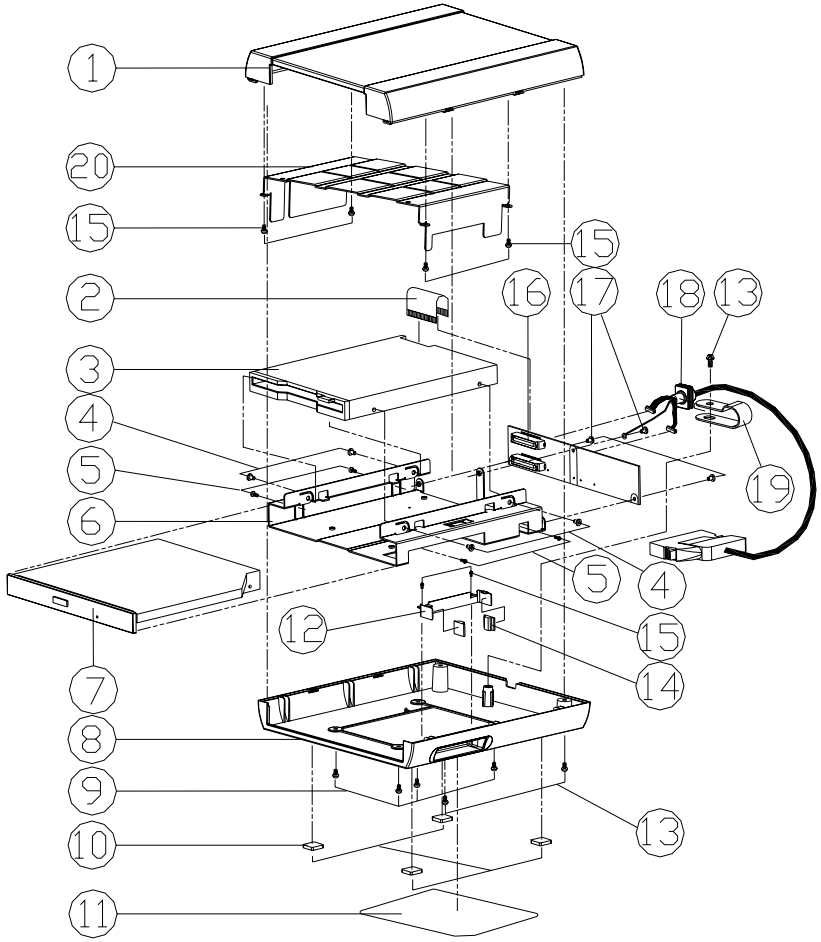


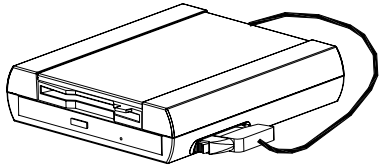
ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-18N0J-012	
2	CD-RW 5 1/4" 8X UJDA330CL-Z 12.7mm KME	85-8078X-K00	
3	SCREW M2*3L K1 BK/D. NY	35-B4125-3RA	
4	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
5	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
6	DVD 5 1/4" 8X 12.7mm SDR-081 QSI	85-7078X-C01	
7	COMBO BOTTOM CASE	42-18N0Z-012	
8	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
9	COMBO FOOT PAD	47-18N1Z-010	
10	PRODUCT LABEL FOR CD-RW/CD-ROM 1800N	45-18N0C-050	
11	RUBBER BRACKET	33-18N0Z-010	
12	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
13	CONNECTOR RUBBER	47-18N2Z-010	
14	SCREWØ2*5L P NI TAP	35-01720-5R0	
15	COMBO BOARD CD-ROM/CD-ROM	77-18N0J-D04-1	
16	SCREW M2*3L B NI ICT NY	35-41120-3RA	
17	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
18	CABLE CLIP	33-18N03-020	
19	ENHANCE BRACKET	33-18N0C-010	

Figure 5
Combo Drive CDRW-DVD (M190S)

Combo Drive - FDD-CD (M190S)

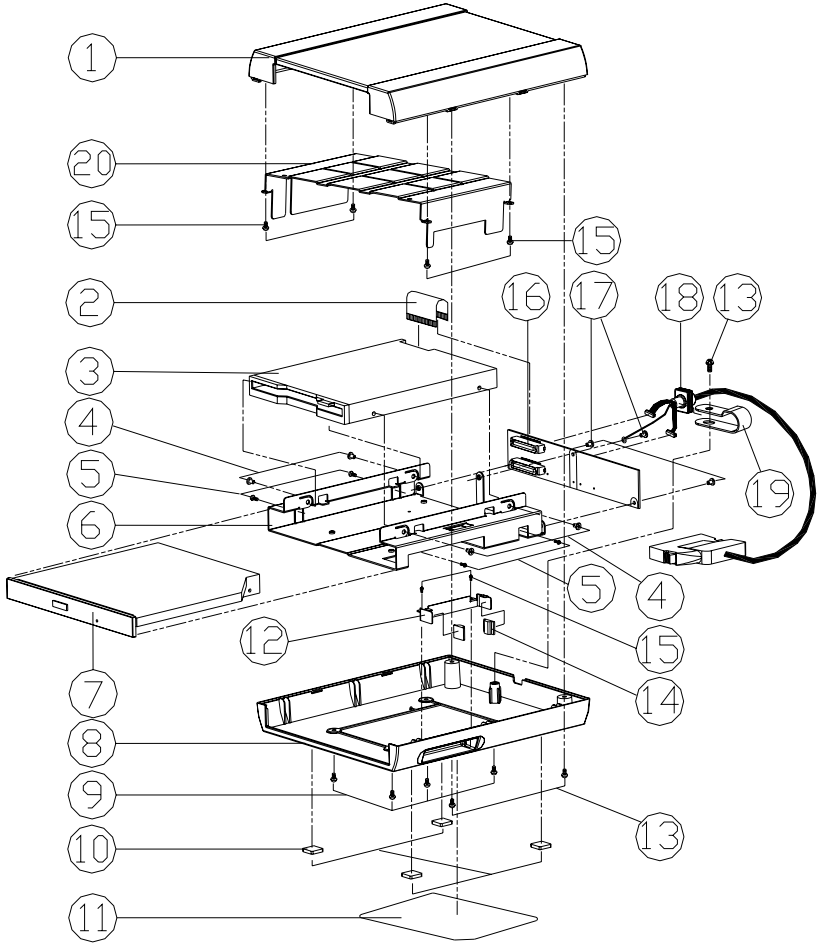
Figure 6
Combo Drive FDD-CD (M190S)

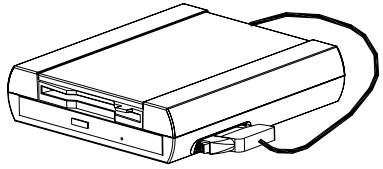




ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-18N0J-012	
2	CABLE FOR COMBO BOARD TO FDD	43-18N0J-020	
3	3.5"FDD 12.7mm FD-05HG-7743 TEAC	85-11700-702	
4	SCREW M2.5*3L K1 BK/O. NY	35-B4125-3RA	
5	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
6	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
7	CD-ROM 5 1/4" 24X SN-124 SAMSUNG	85-607□X-S00	TOSHIBA
8	COMBO BOTTOM CASE	42-18N0Z-012	
9	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
10	COMBO FOOT PAD	47-18N1Z-010	
11	PRODUCT LABEL FOR CDRW/FDD 1800N	45-18N0C-020	
12	RUBBER BRACKET	33-18N0Z-010	
13	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
14	CONNECTOR RUBBER	47-18N2Z-010	
15	SCREWØ2*5L P NI TAP	35-01720-5R0	
16	COMBO BOARD FDD/CD-ROM	77-18N0J-D04	
17	SCREW M2*3L B NI ICT NY	35-41120-3RA	
18	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
19	CABLE CLIP	33-18N03-020	
20	ENHANCE BRACKET	33-18N0C-010	

Combo Drive - FDD-CDRW (M190S)



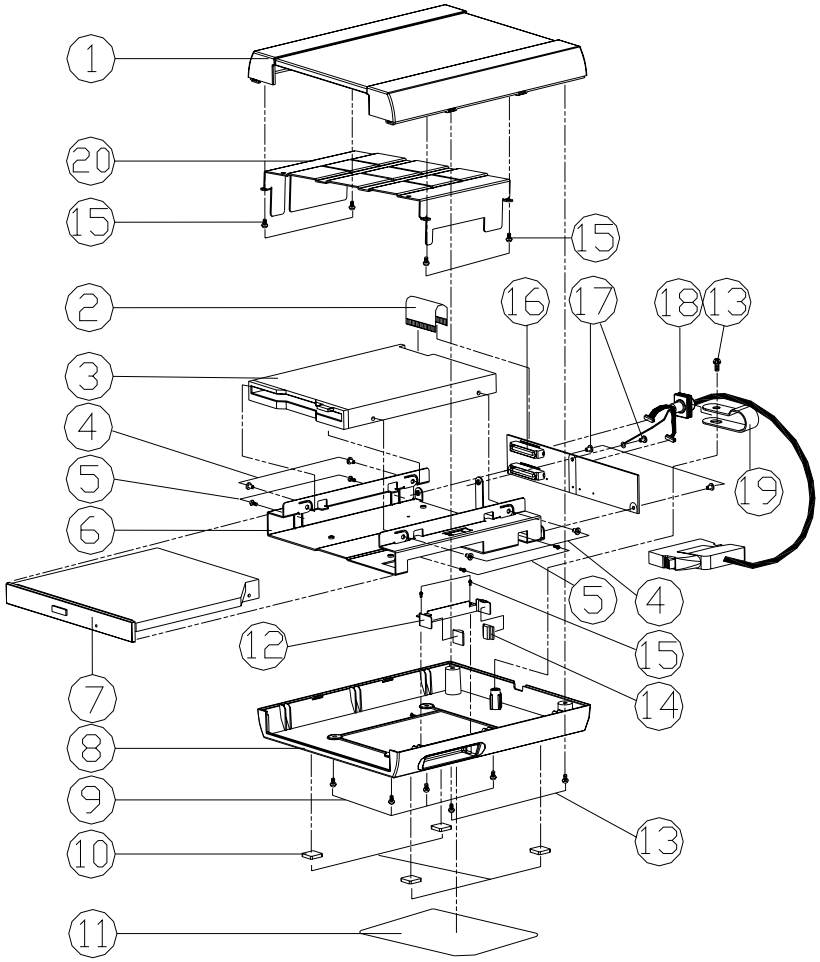


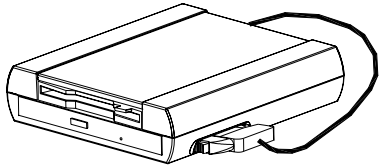
ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-18N0J-012	
2	CABLE FOR COMBO BOARD TO FDD	43-18N0J-020	
3	3.5"FDD 12.7mm FD-05HG-7743 TEAC	85-11700-702	
4	SCREW M2.5*3L K1 BK/O. NY	35-B4125-3RA	
5	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
6	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
7	CD-RW 5 1/4" 8X UJDA330CL-Z 12.7mm	85-8078X-K00	KME
8	COMBO BOTTOM CASE	42-18N0Z-012	
9	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
10	COMBO FOOT PAD	47-18N1Z-010	
11	PRODUCT LABEL FOR CDRW/FDD 1800N	45-18N0C-020	
12	RUBBER BRACKET	33-18N0Z-010	
13	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
14	CONNECTOR RUBBER	47-18N2Z-010	
15	SCREWØ2*5L P NI TAP	35-01720-5R0	
16	COMBO BOARD FDD/CD-ROM	77-18N0J-D04	
17	SCREW M2*3L B NI ICT NY	35-41120-3RA	
18	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
19	CABLE CLIP	33-18N03-020	
20	ENHANCE BRACKET	33-18N0C-010	

Figure 7
Combo Drive FDD -CDRW (M190S)

Combo Drive - FDDT-DVDQ (M190S)

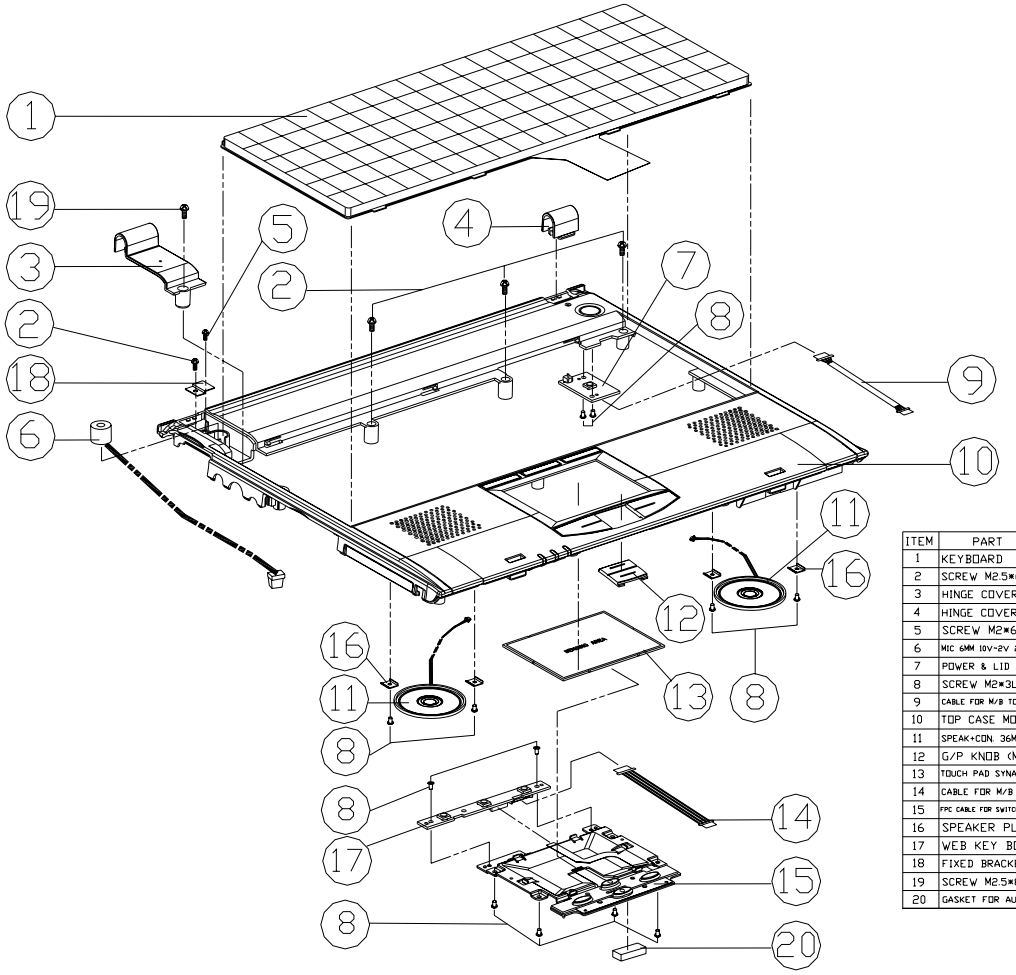
Figure 8
Combo Drive FDDT-DVDQ (M190S)





ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-18N0J-012	
2	CABLE FOR COMBO BOARD TO FDD	43-18N0J-020	
3	3.5"FDD 12.7mm FD-05HG-7743 TEAC	85-11700-702	
4	SCREW M2.5*3L K1 BK/O. NY	35-B4125-3RA	
5	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
6	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
7	DVD 5 1/4" 8X 12.7mm SDR-081	85-7078X-C01	QSI
8	COMBO BOTTOM CASE	42-18N0Z-012	
9	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
10	COMBO FOOT PAD	47-18N1Z-010	
11	PRODUCT LABEL FOR DVD-ROM/FDD 1800N	45-18N0C-030	
12	RUBBER BRACKET	33-18N0Z-010	
13	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
14	CONNECTOR RUBBER	47-18N2Z-010	
15	SCREWØ2*6L P NI TAP	35-01720-5R0	
16	COMBO BOARD FDD/CD-ROM	77-18N0J-D04	
17	SCREW M2*3L B NI ICT NY	35-41120-3RA	
18	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
19	CABLE CLIP	33-18N03-020	
20	ENHANCE BRACKET	33-18N0C-010	

Top (M192S)



ITEM	PART NAME	PART NO	REMARK
1	KEYBOARD	80-18N08-7G0	
2	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
3	HINGE COVER(L)	42-18272-022	
4	HINGE COVER(R)	42-18272-011	
5	SCREW M2*6L P BZ ICT NY	35-06120-6RA	
6	MIC 6MM 10V-2V 2.2K (120MM) W/CABLE	23-E0610-22J	
7	POWER & LID SWITCH BOARD	77-18N0S-D0X	
8	SCREW M2*3L K1 NI ICT NY	35-B1120-3RA	
9	CABLE FOR M/B TO POWER & LID SWITCH	43-18N0S-010	
10	TOP CASE MODULE	39-18202-017	
11	SPEAK+CON 36MM 1W 80MM 1800N	23-53610-800	
12	G/P KNOB (M)	42-18282-052	
13	TOUCH PAD SYNAPTICS TM41PDG351-1	49-42002-010	
14	CABLE FOR M/B TO WEB KEY BOARD	43-18N0W-010	
15	FPC CABLE FOR SWITCH WITH G/P HOLDER MODULE	43-18N01-013	
16	SPEAKER PLATE	33-18N0T-010	
17	WEB KEY BOARD	77-M190W-D0X	
18	FIXED BRACKET FOR CABLE	33-18N03-040	
19	SCREW M2.5*8 P CZ ICT	35-03125-8R0	
20	GASKET FOR AUDIO (W6*L35*6.5t)	47-00190-183	

Figure 9
Top (M192S)

Bottom (M192S)

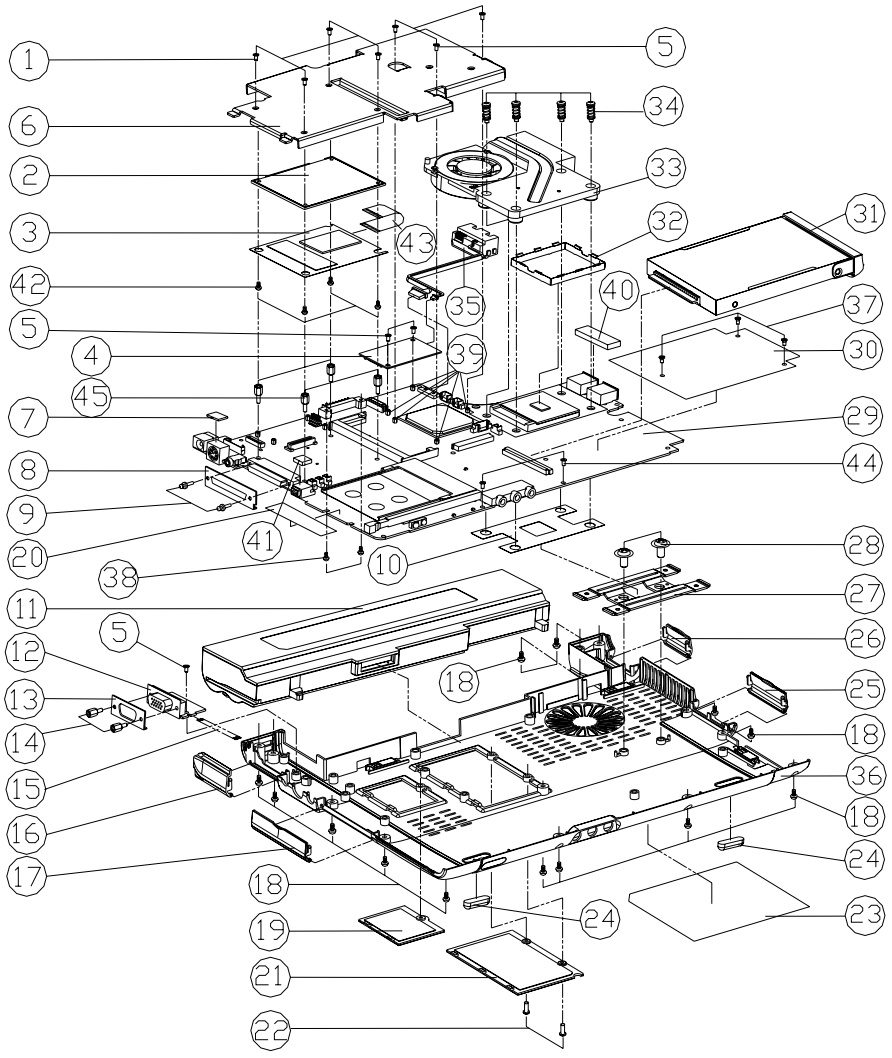
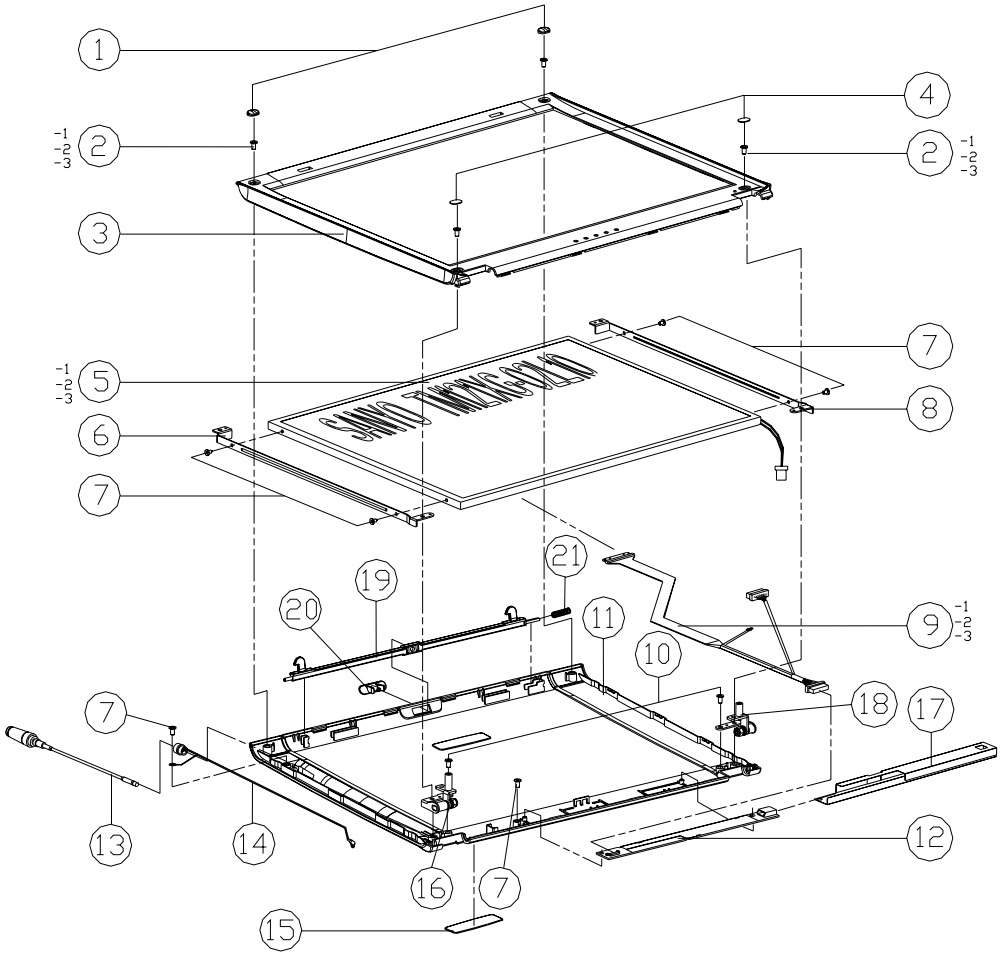


Figure 10
Bottom (M192S)

ITEM	PART NAME	PART NO	REMARK
1	SCREW M2*5L F BZ ICT	35-22120-5R0	
2	GPRS BOARD VD6.0	77-18N0I-D06	
3	MC35 GPRS MODULE	88-18N61-270	
4	MDC MODEM	76-32200-003	
5	SCREW M2*4L K1 BNI ICT	35-B9120-4R0	
6	CHIP HEAT SINK	31-18N0N-010	
7	GASKET FOR PS2 (W7*L12*1t)	47-00190-1K1	
8	I/O BRACKET	33-18N0S-010	
9	SCREW FOR HONDA 68P	21-14D00-417-S	
10	CPU SUPPORTOR MYLAR	40-18N5N-010	
11	BAT.P S.L. 3S2P 11.1V 3600mAHSMP/PANASONIC	87-18N8S-4CC	Reference Ass'y Dwg (99-18N05-0503)
11	BAT.P S.L. 3S2P 11.1V 3600mAHGLW/PANASONIC	87-18N8S-45C	Reference Ass'y Dwg (99-18N05-0507)
12	CRT BOARD	77-M190H-D0X	
13	CRT BRACKET	33-18N0S-020	
14	HEX STUD (SUM22 NI-PL) 11mm	34-07009-011-A	
15	CABLE FOR M/B TO CRT BOARD FCC 12PIN	43-18N0H-010	
16	CRT COVER	42-18273-030	
17	1394 COVER	42-18273-040	
18	SCREW M2.5*6L K BZ ICT	35-82125-6R0	
19	SIM COVER+SCREW MODULE	42-18273-103	
20	MYLAR FOR PCMCIA	40-32004-000	
21	DIMM COVER	42-18273-013	
22	SCREW M2*4L P BN ICT	35-09120-4R0	
23	PRODUCT LABEL FOR M190S	45-M1903-010	
24	BOTTOM CASE RUBBER PAD	47-18N23-010	
25	UBS COVER	42-18273-050	
26	LAN COVER	42-18273-020	
27	CPU SUPPORTOR	33-18N03-011	
28	SCREW M2.5*2.5L B NI ICT W/WAS NY	35-41025-2R5	
29	MAIN BOARD	77-M190-D0X	
30	HDD MYLAR	40-18N0I-011	
31	W/O HDD ASS'Y 1800N	79-18N21-010	Reference Ass'y Dwg (99-18N05-0403)
32	SPRING PLATE	38-18N0S-010	
33	HEAT SINK MODULE M190S	31-M190N-100	
34	SCREW B NI ICT M2.5*12L SCREW=2	35-41125-12A	
35	CABLE FOR M/B TO MDC & LAN (WIRE 2+8PIN)	43-18N0Z-011	
36	BOTTOM CASE MODULE	39-18203-014	
37	SCREW M2.0*3L F NI ICT NY	35-21120-3RA	
38	SCREW M2*6L P BZ ICT NY	35-06120-6RA	
39	HEX.STUD 5.0mm F=M2 M=NONE SN	34-P2T0S-010	
40	GASKET FOR USB (W9*L33*3.5t)	47-00190-331	
41	GASKET FOR 1394 (W7*L10*2t)	47-00190-011	
42	SCREW M2*3L B NI ICT NY	35-41120-3RA	
43	FFC FIAT CABLE 40PINS 31+-2MM PITCH 0.5MM	43-18N0G-020	
44	SCREW M2*3L K1 NI ICT NY	35-B1120-3RA	
45	HEX STUD H=7mm M=M2 5 WHITE NY	34-18N0S-030	

LCD (M192S)

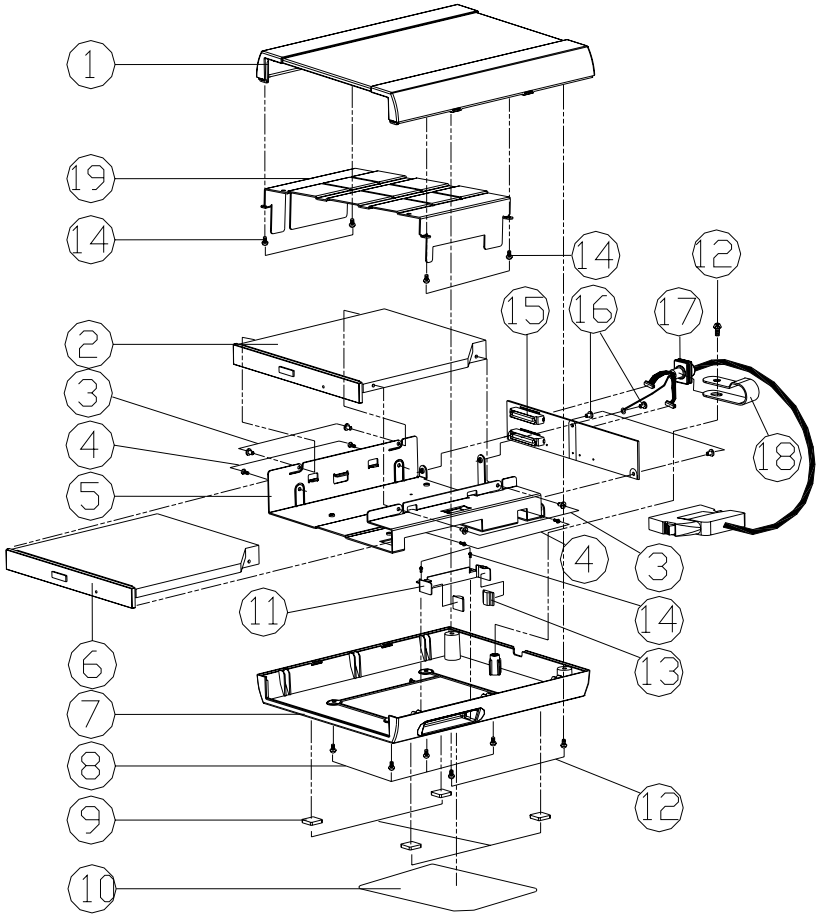


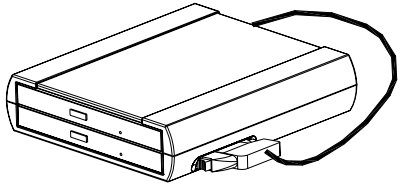
ITEM	PART NAME	PART NO	REMARK
1	DISPLAY RUBBER PAD(UP)	47-18N21-011	
2-1 2-2 2-3	SCREW M2.5*6L K1 BZ ICT	35-82125-6R0	
3	FRONT PANEL MODULE	39-18N01-011	
4	DISPLAY RUBBER PAD(BOTTOM)	47-18N21-020	
5-1	LCD 12.1" XGA TFT	50-F2255-M00	SAMSUNG LTN121XL-L
5-2	LCD 12.1" XGA TFT	50-F2255-H00	HYUNDAI HT12X12-10
5-3	LCD 12.1" XGA TFT	50-F2253-L00	LG LP121X1-A2(C2)
6	LCD BRACKET FOR SAMSUNG (L)	33-18N01-040	
7	SCREW M2*2.5L K1 BZ ICT NY ø4	35-B6120-2RF	
8	LCD BRACKET FOR SAMSUNG (R)	33-18N01-030	
9-1	COAXIAL CABLE FOR M/B TO LCD	43-18N01-034	SAMSUNG LTN121XL-L
9-2	COAXIAL CABLE FOR M/B TO LCD	43-18N01-053	HYUNDAI HT12X12-10
9-3	COAXIAL CABLE FOR M/B TO LCD	43-18N01-034	LG(LP121X1-A2(C2))
10	SCREW M2.5*4L K NI ICT NY	35-B1125-4RA-A	
11	BACK PANEL MODULE	39-18N01-022	
12	INVERTER BOARD	77-M190R-D0X	
13	GSM ROD ANTENNA 900/1800	23-73900-001	
14	GSM ANTENNA CABLE 30CM/1.5MM DIA	43-18N0G-011	
15	NAME PLATE "NOTEBOOK"	45-18N01-010	
16	HINGE(L)	33-18N01-011	
17	INVERTER MYLAR	40-18N5R-011	
18	HINGE(R)	33-18N01-021	
19	LCD HOOK	42-18NA1-010	
20	LCD KNOB	42-18N81-011	
21	SPRING FOR HOOK (ø3.7*15*0.3d)	38-21P30-011	

Figure 11
LCD (M192S)

Combo Drive - CDRW-CD (M192S)

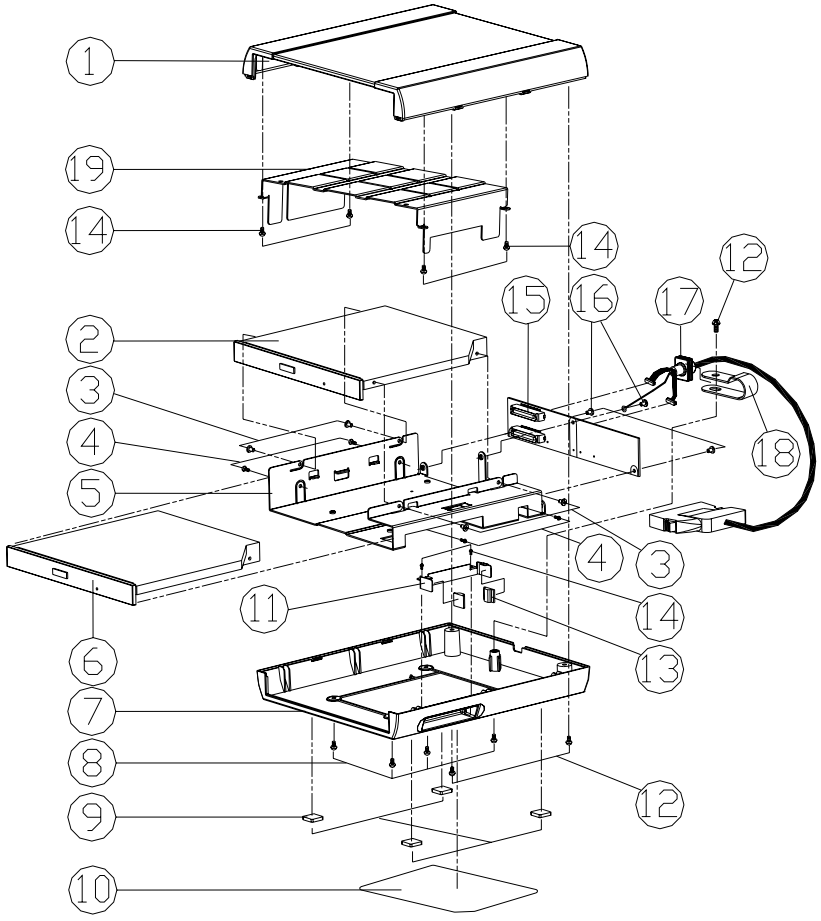
Figure 12
Combo Drive CDRW-CD (M192S)

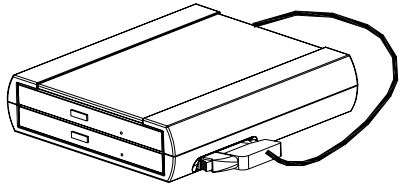




ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-1820J-012	
2	CD-ROM 5 1/4" 24X SN-124 SAMSUNG	85-607□X-S00	
3	SCREW M2.5*3L K1 BK/□. NY	35-B4125-3RA	
4	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
5	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
6	CD-RW 5 1/4" 8X UJDA330CL-Z 12.7mm KME	85-8078X-K00	
7	COMBO BOTTOM CASE	42-1820Z-012	
8	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
9	COMBO FOOT PAD	47-18N1Z-010	
10	PRODUCT LABEL FOR CD-RW/CD-ROM 1800N	45-18N0C-040	
11	RUBBER BRACKET	33-18N0Z-010	
12	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
13	CONNECTOR RUBBER	47-18N2Z-010	
14	SCREWØ2*5L P NI TAP	35-01720-5R0	
15	COMBO BOARD CD-ROM/CD-ROM	77-18N0J-D04	
16	SCREW M2*3L B NI ICT NY	35-41120-3RA	
17	CABLE FOR M/B TO COMBO BOARD CDROM/FDD	43-18N0J-010	
18	CABLE CLIP	33-18N03-020	
19	ENHANCE BRACKET	33-18N0C-010	

Combo Drive - CDRW-DVD (M192S)



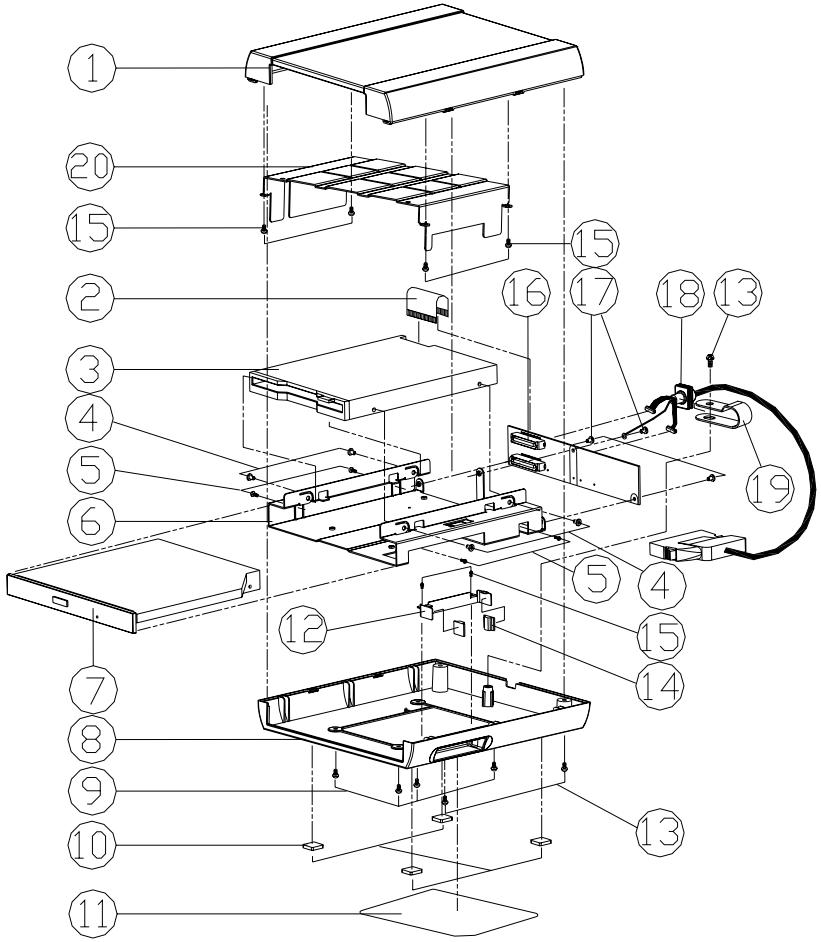


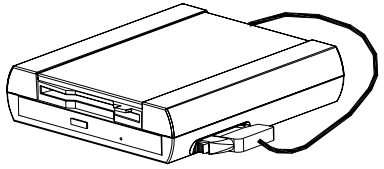
ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-1820J-012	
2	CD-RW 5 1/4" 8X UJDA330CL-Z 12.7mm KME	85-8078X-K00	
3	SCREW M2*3L K1 BK/D. NY	35-B4125-3RA	
4	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
5	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
6	DVD 5 1/4" 8X 12.7mm SDR-081 QSI	85-7078X-C01	
7	COMBO BOTTOM CASE	42-1820Z-012	
8	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
9	COMBO FOOT PAD	47-18N1Z-010	
10	PRODUCT LABEL FOR CD-RW/CD-ROM 1800N	45-18N0C-050	
11	RUBBER BRACKET	33-18N0Z-010	
12	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
13	CONNECTOR RUBBER	47-18N2Z-010	
14	SCREWØ2*5L P NI TAP	35-01720-5R0	
15	COMBO BOARD CD-ROM/CD-ROM	77-18N0J-D04-1	
16	SCREW M2*3L B NI ICT NY	35-41120-3RA	
17	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
18	CABLE CLIP	33-18N03-020	
19	ENHANCE BRACKET	33-18N0C-010	

Figure 13
Combo Drive CDRW-DVD (M192S)

Combo Drive - FDD-CD (M192S)

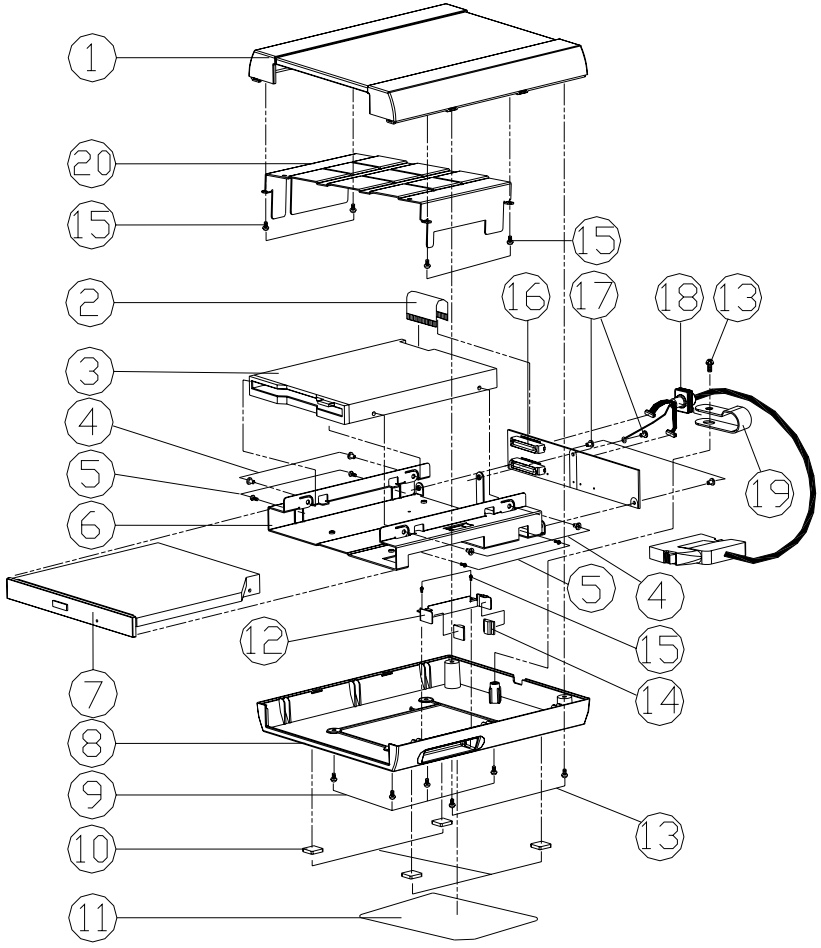
Figure 14
Combo Drive FDD-CD (M192S)

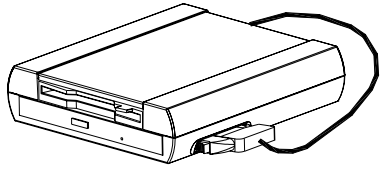




ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-1820J-012	
2	CABLE FOR COMBO BOARD TO FDD	43-18N0J-020	
3	3.5"FDD 12.7mm FD-05HG-7743 TEAC	85-11700-702	
4	SCREW M2.5*3L K1 BK/D. NY	35-B4125-3RA	
5	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
6	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
7	CD-ROM 5 1/4" 24X SN-124 SAMSUNG	85-607□X-S00	TOSHIBA
8	COMBO BOTTOM CASE	42-1820Z-012	
9	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
10	COMBO FOOT PAD	47-18N1Z-010	
11	PRODUCT LABEL FOR CDRW/FDD 1800N	45-18N0C-020	
12	RUBBER BRACKET	33-18N0Z-010	
13	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
14	CONNECTOR RUBBER	47-18N2Z-010	
15	SCREWØ2*5L P NI TAP	35-01720-5R0	
16	COMBO BOARD FDD/CD-ROM	77-18N0J-D04	
17	SCREW M2*3L B NI ICT NY	35-41120-3RA	
18	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
19	CABLE CLIP	33-18N03-020	
20	ENHANCE BRACKET	33-18N0C-010	

Combo Drive - FDD-CDRW (M192S)



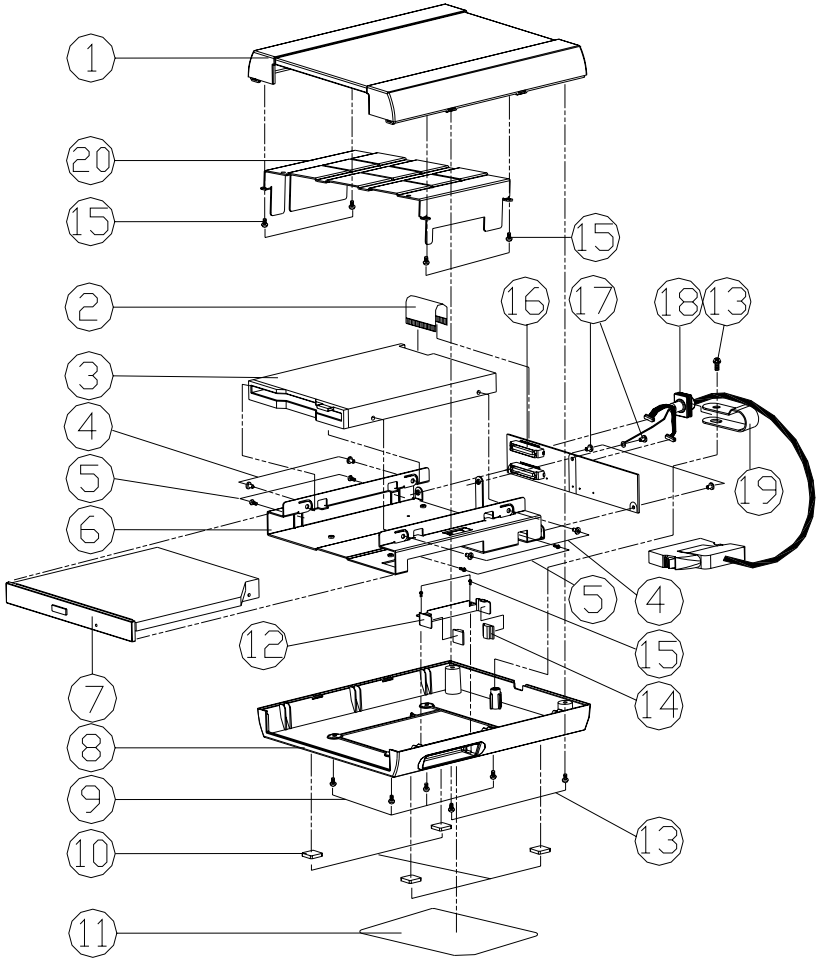


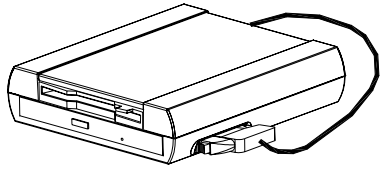
ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-1820J-012	
2	CABLE FOR COMBO BOARD TO FDD	43-18N0J-020	
3	3.5"FDD 12.7mm FD-05HG-7743 TEAC	85-11700-702	
4	SCREW M2.5*3L K1 BK/O. NY	35-B4125-3RA	
5	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
6	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
7	CD-RW 5 1/4" 8X UJDA330CL-Z 12.7mm	85-8078X-K00	KME
8	COMBO BOTTOM CASE	42-1820Z-012	
9	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
10	COMBO FOOT PAD	47-18N1Z-010	
11	PRODUCT LABEL FOR CDRW/FDD 1800N	45-18N0C-020	
12	RUBBER BRACKET	33-18N0Z-010	
13	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
14	CONNECTOR RUBBER	47-18N2Z-010	
15	SCREWØ2*5L P NI TAP	35-01720-5R0	
16	COMBO BOARD FDD/CD-ROM	77-18N0J-D04	
17	SCREW M2*3L B NI ICT NY	35-41120-3RA	
18	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
19	CABLE CLIP	33-18N03-020	
20	ENHANCE BRACKET	33-18N0C-010	

Figure 15
Combo Drive FDD-CDRW (M192S)

Combo Drive - FDDT-DVDQ (M192S)

Figure 16
Combo Drive FDDT-DVDQ (M192S)





ITEM	PART NAME	PART NO	REMARK
1	COMBO TOP CASE(FOR FDD)	42-1820J-012	
2	CABLE FOR COMBO BOARD TO FDD	43-18N0J-020	
3	3.5"FDD 12.7mm FD-05HG-7743 TEAC	85-11700-702	
4	SCREW M2.5*3L K1 BK/O. NY	35-B4125-3RA	
5	SCREW M2*2.5L P NI ICT NY	35-01120-2RE	
6	COMBO BRACKET FOR FDD/CD-ROM	33-18N0J-012	
7	DVD 5 1/4" 8X 12.7mm SDR-081	85-7078X-C01	QSI
8	COMBO BOTTOM CASE	42-1820Z-012	
9	SCREW M2.5*4L F BNI ICT NY	35-29125-4R0	
10	COMBO FOOT PAD	47-18N1Z-010	
11	PRODUCT LABEL FOR DVD-ROM/FDD 1800N	45-18N0C-030	
12	RUBBER BRACKET	33-18N0Z-010	
13	SCREW M2.5*6L P BZ ICT	35-06125-6R0-A	
14	CONNECTOR RUBBER	47-18N2Z-010	
15	SCREWØ2*6L P NI TAP	35-01720-5R0	
16	COMBO BOARD FDD/CD-ROM	77-18N0J-D04	
17	SCREW M2*3L B NI ICT NY	35-41120-3RA	
18	CABLE FOR M/B TO COMBO BOARD	43-18N0J-010	
19	CABLE CLIP	33-18N03-020	
20	ENHANCE BRACKET	33-18N0C-010	

Appendix B:Schematic Diagrams

This appendix has circuit diagrams of the systems PCB's:

Printed Circuit Board

System Board	71-M1900-D02

The following table indicates where to find the appropriate schematic diagram.

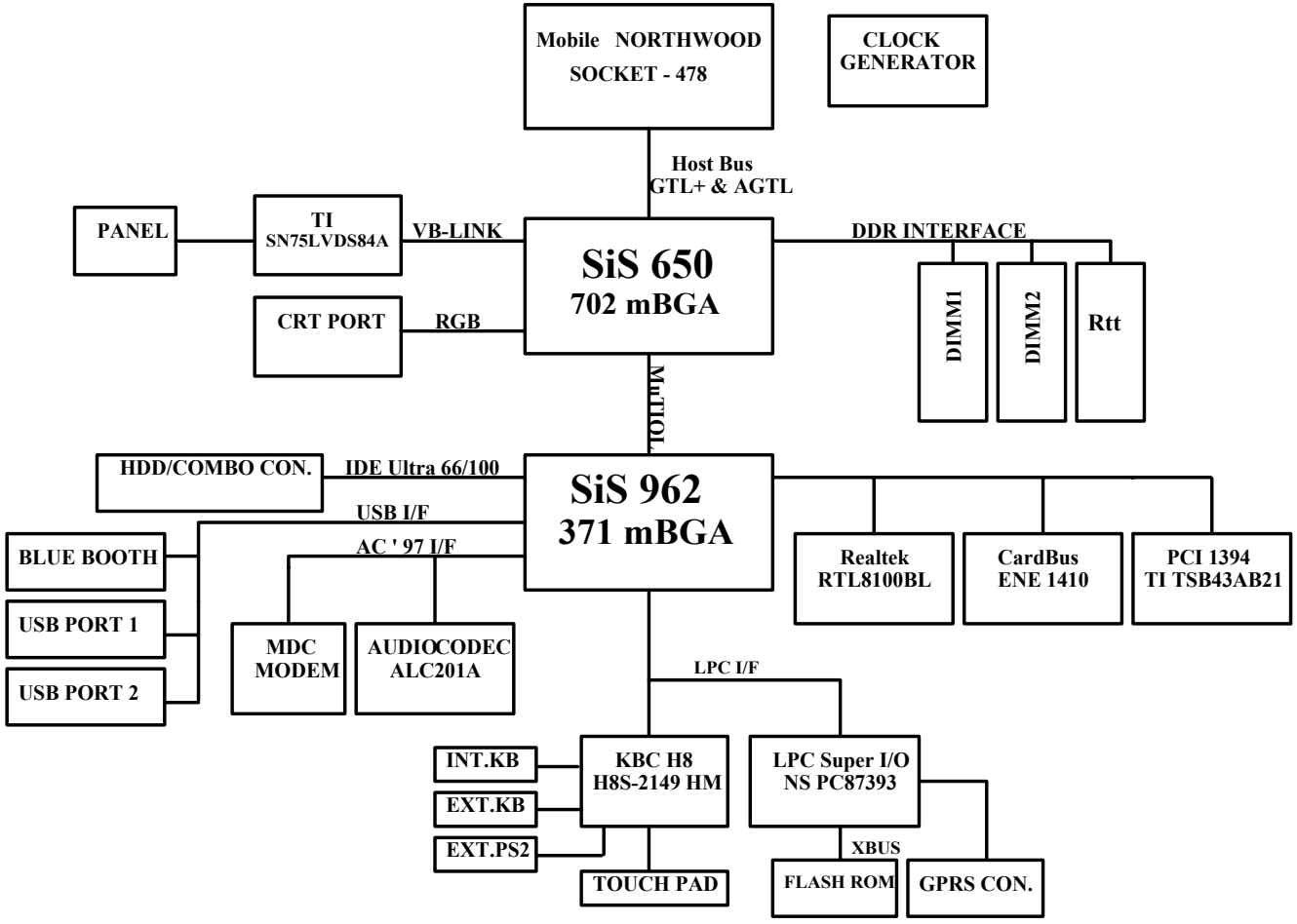
Table 1 - 1
Schematic Diagram

Diagram - Page	Diagram - Page
System Block Diagram - Page B - 3	*PCM PWR & Bluetooth Interface - Page B - 20*
Socket 478 - 1 of 2 - Page B - 4	*TI1394 TSB43AB21 - Page B - 21*
Socket 478 - 2 of 2 - Page B - 5	*LPC Super I/O - Page B - 22*
Clock Generator - Page B - 6	*LAN RTL8100BL - Page B - 23*
650-1 (Host/AGP) 1 of 4 - Page B - 7	*LPC - H8 - Page B - 24*
650-2 (DDR Memory) 2 of 4 - Page B - 8	*Fan Control & SpeedStep - Page B - 25*
DDRMemory DIMM - Page B - 9	*System Power Control Board - Page B - 26*
SSTL-2 Termination Resistors - Page B - 10	*Audio Codec - ALC201A - Page B - 27*
650-3 (LVDS Interface) 3 of 4 - Page B - 11	*Audio Out / GPRS Connector - Page B - 28*
Panel Interface/LED Indicator - Page B - 12	*V_Core - Page B - 29*
650-4 (Powers) 4 of 4 - Page B - 13	*+3V, +5V, +12V - Page B - 30*
961A-1 (PCI / IDE / HyperZip) 1 of 4 - Page B - 14	*+2.5V, +1.25V - Page B - 31*
HDD / Combo CON - Page B - 15	*+1.8V, 3VH8, VDD1.8, VCCID - Page B - 32*
961A-2 (Misc Signals) 2 of 4 - Page B - 16	*Charger - PWM - Page B - 33*
961A-3 (USB) 3 of 4 - Page B - 17	*CRT Board - Page B - 34*
961A-4 (Power & RTC) 4 of 4 - Page B - 18	*Hot-Key - Page B - 35*
PCMCIA ENE1410 - Page B - 19	*Power & Lid Switch Board - Page B - 36*

System Block Diagram

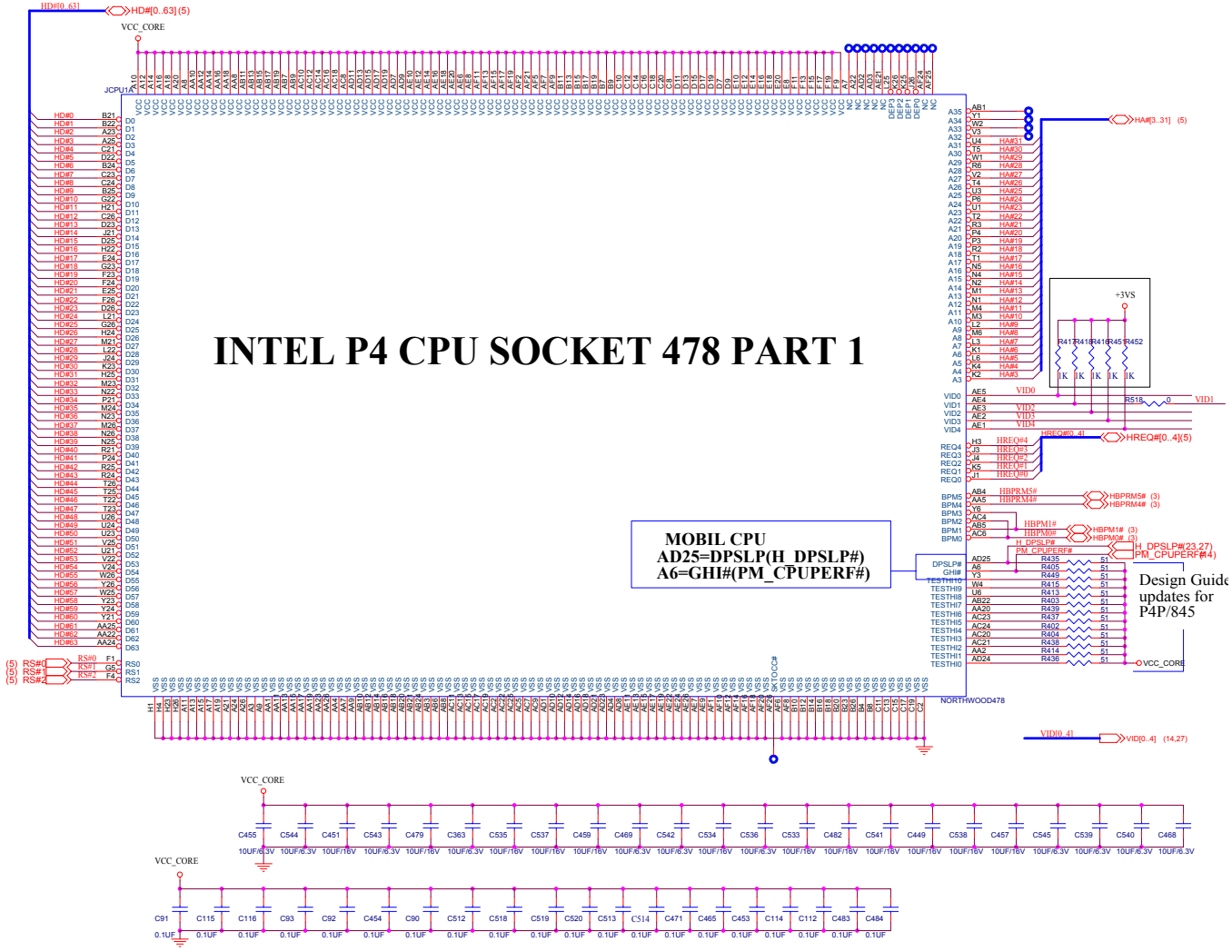
Sheet 1 of 34
System Block Diagram

M190S System Block Diagram



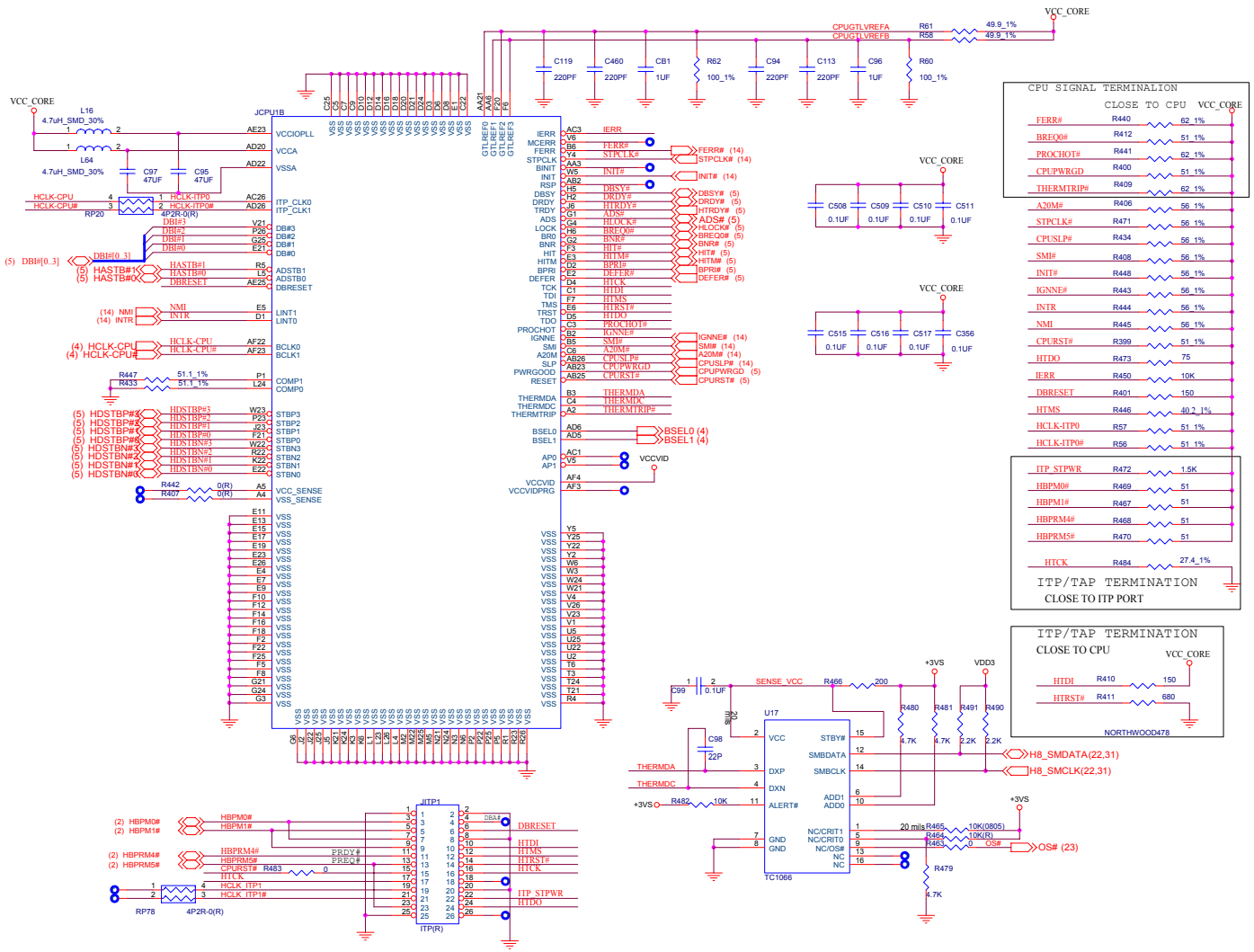
Socket 478 - 1 of 2

Sheet 2 of 34
Socket 478 - 1 of 2



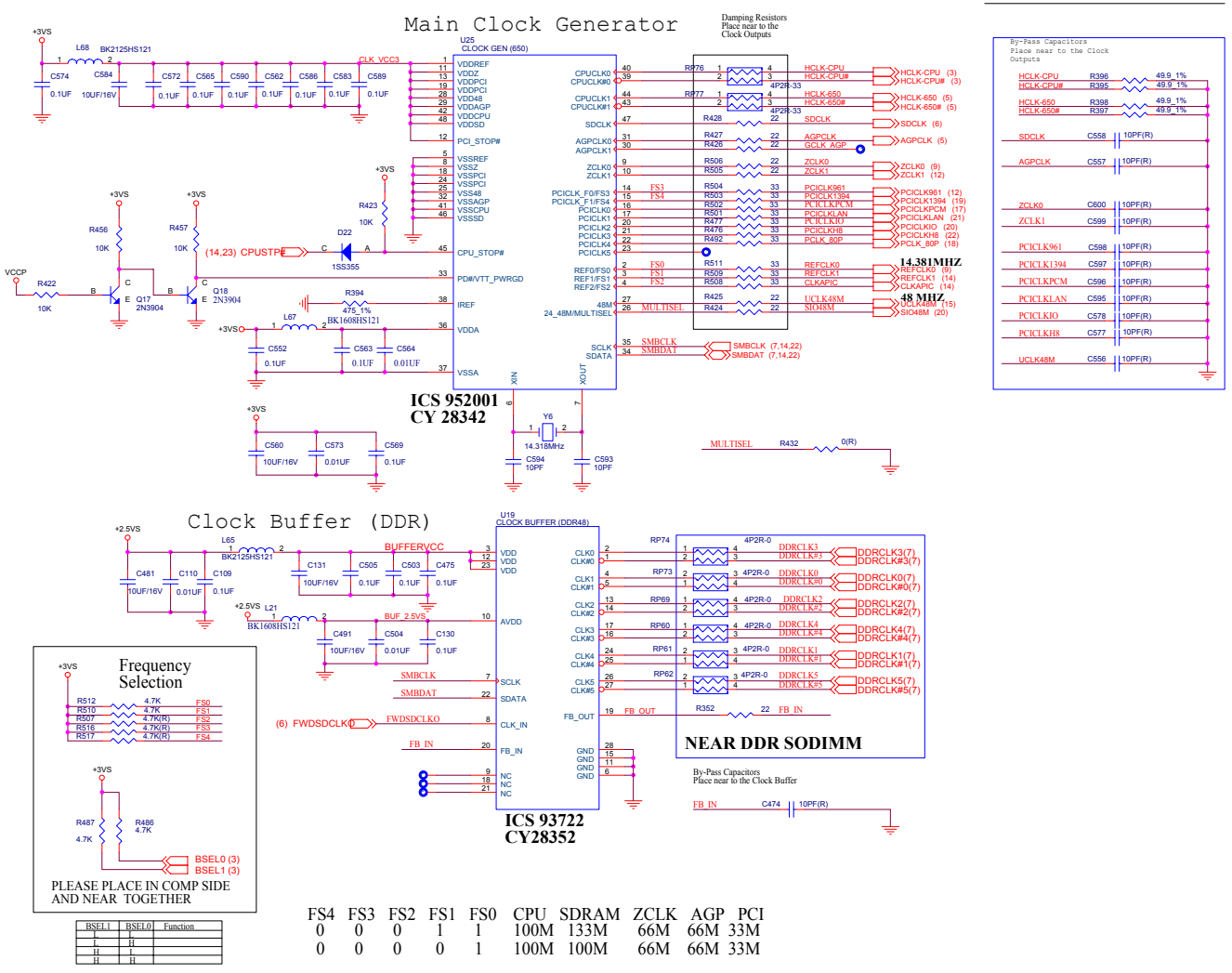
Socket 478 - 2 of 2

Sheet 3 of 34
Socket 478 - 2 of 2



Clock Generator

Sheet 4 of 34
Clock Generator

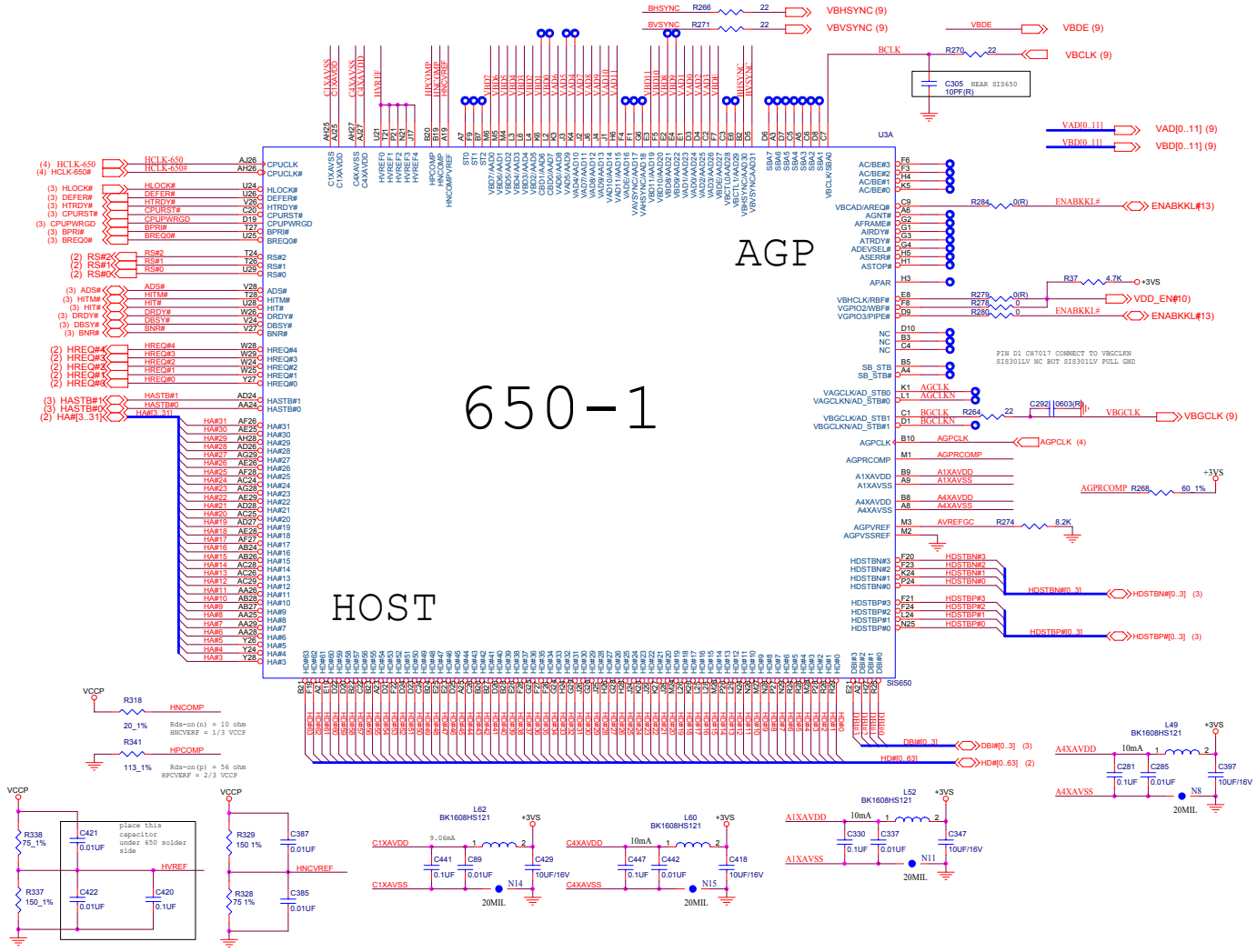


FS4	FS3	FS2	FS1	FS0	CPU	SDRAM	ZCLK	AGP	PCI
0	0	0	1	1	100M	133M	66M	66M	33M
0	0	0	0	1	100M	100M	66M	66M	33M

BSEL1	BSEL0	Function
L	L	
L	H	
H	L	
H	H	

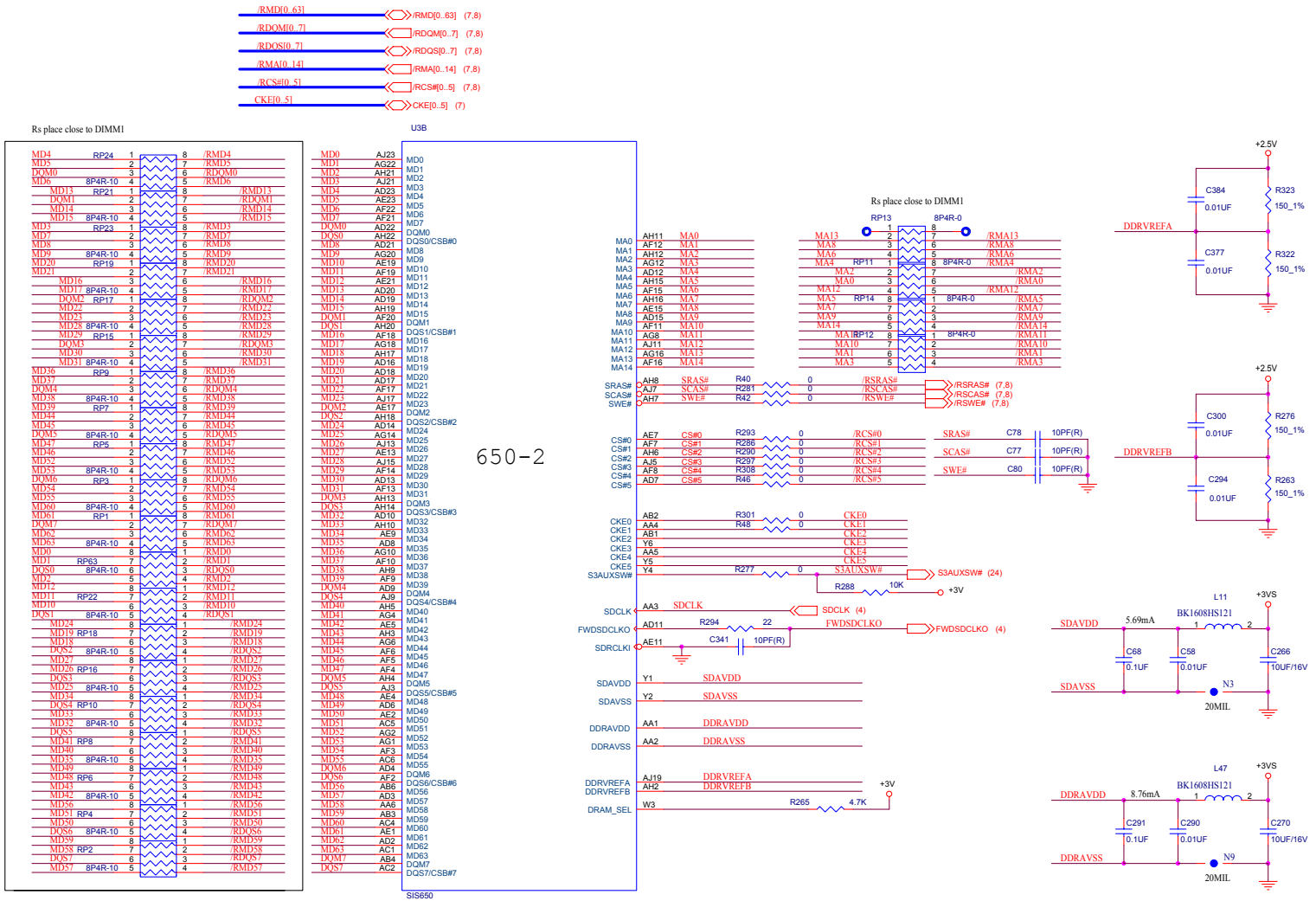
650-1 (Host/AGP) - 1 of 4

Sheet 5 of 34
650-1 (Host/AGP)
1 of 4



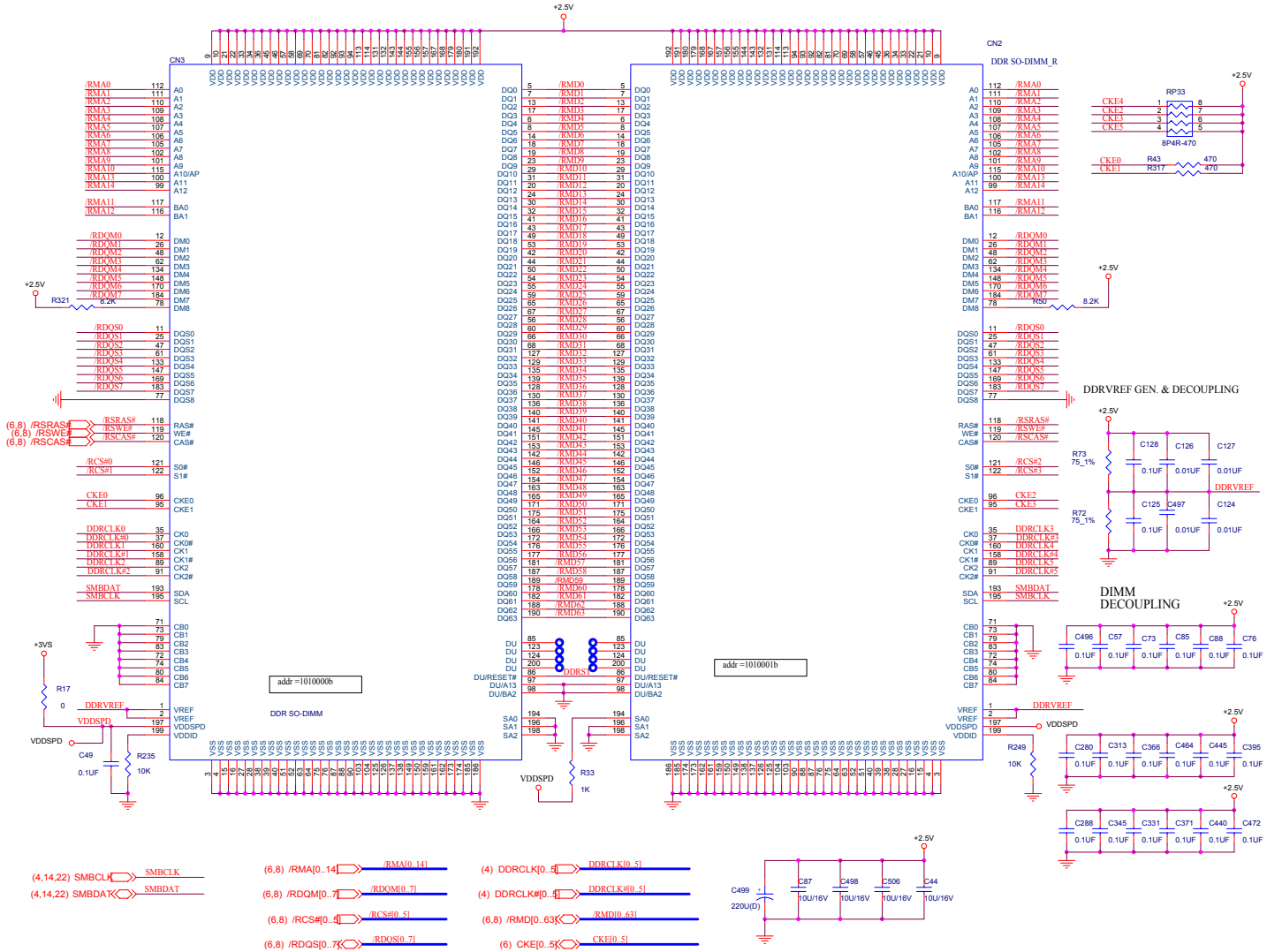
650-2 (DDR Memory) - 2 of 4

Sheet 6 of 34
650-2 (DDR Memory)
2 of 4



DDR Memory DIMM

Sheet 7 of 34
DDRMemory DIMM

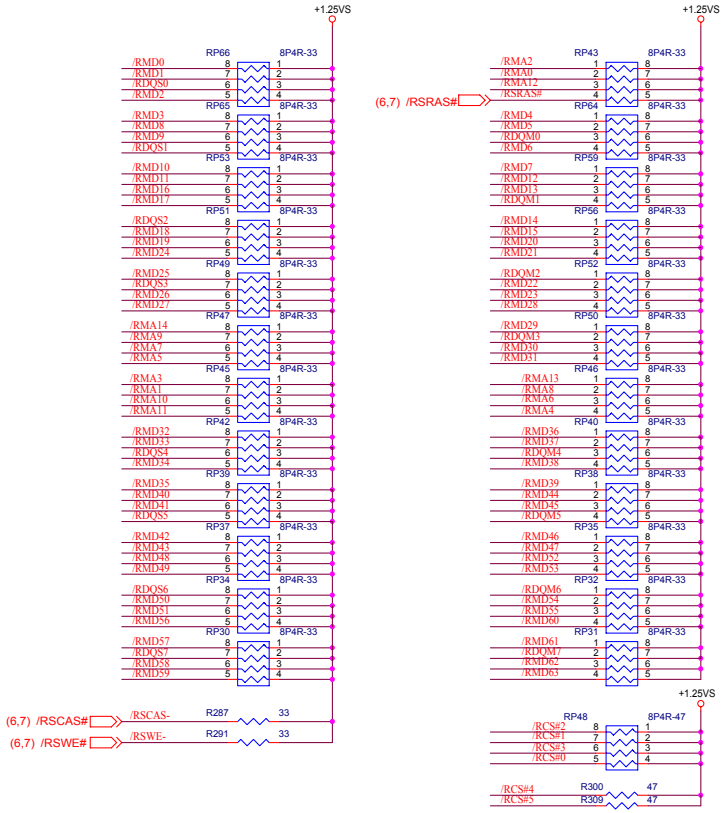


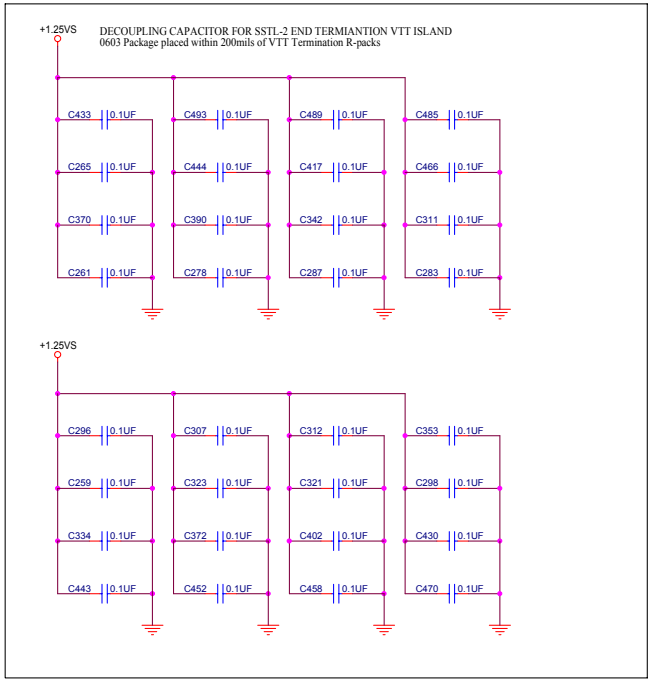
SSTL-2 Termination Resistors

Sheet 8 of 34
SSTL-2 Termination Resistors

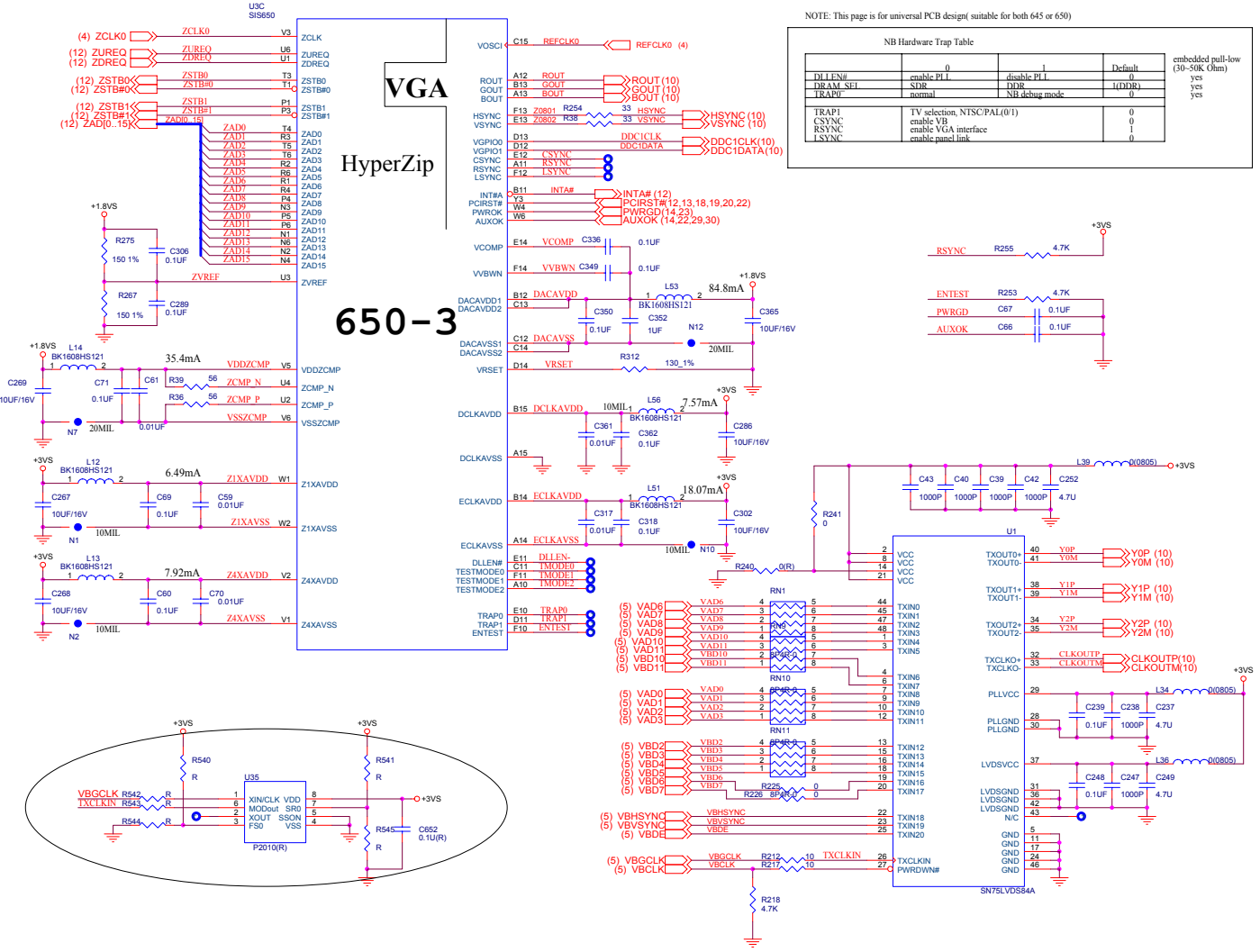
SSTL-2 Termination Resistors

	DDR	Rs	Rtt
MD/DQM(/DQS)	SSTL-2	10	33
MA/Control	SSTL-2	0	33
CS	SSTL-2	0	47
CKE	OD 2.5V		



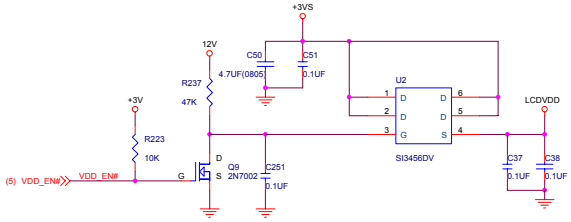


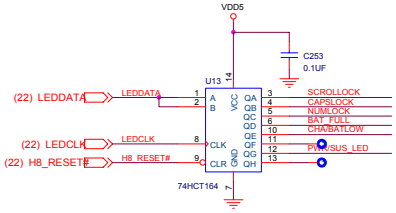
650-3 (LVDS Interface) - 3 of 4

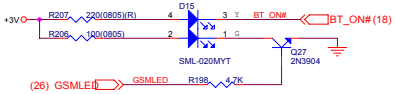


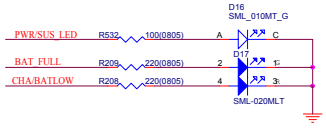
Panel Interface / LED Indicator

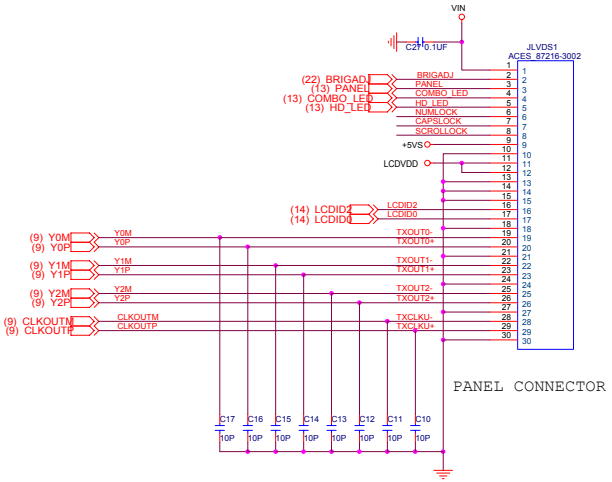
Sheet 10 of 34
Panel Interface/LED Indicator

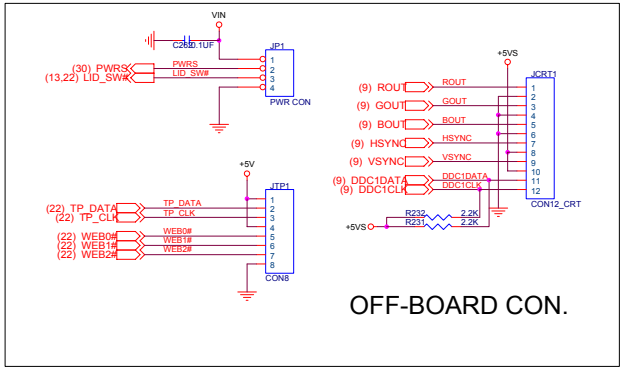






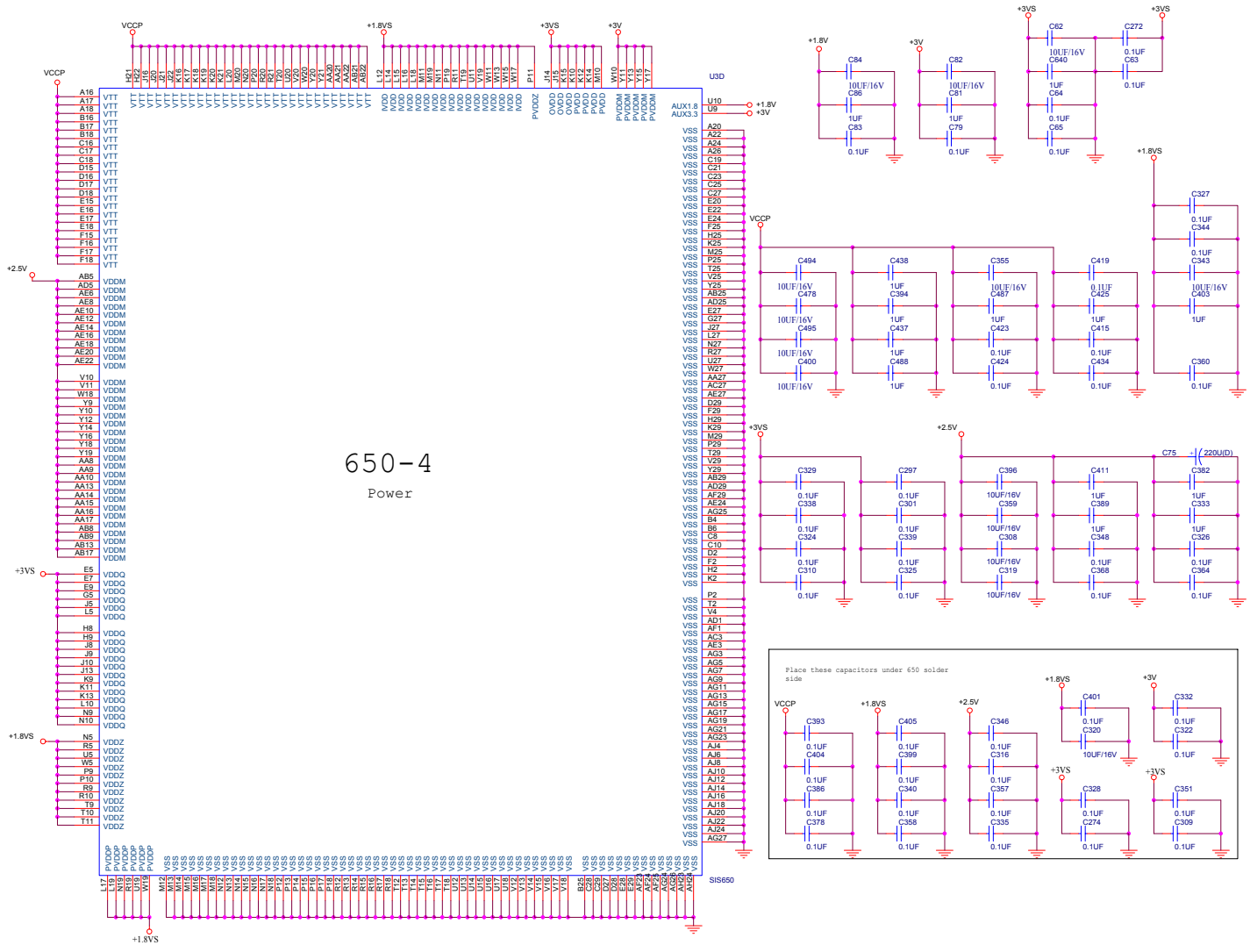






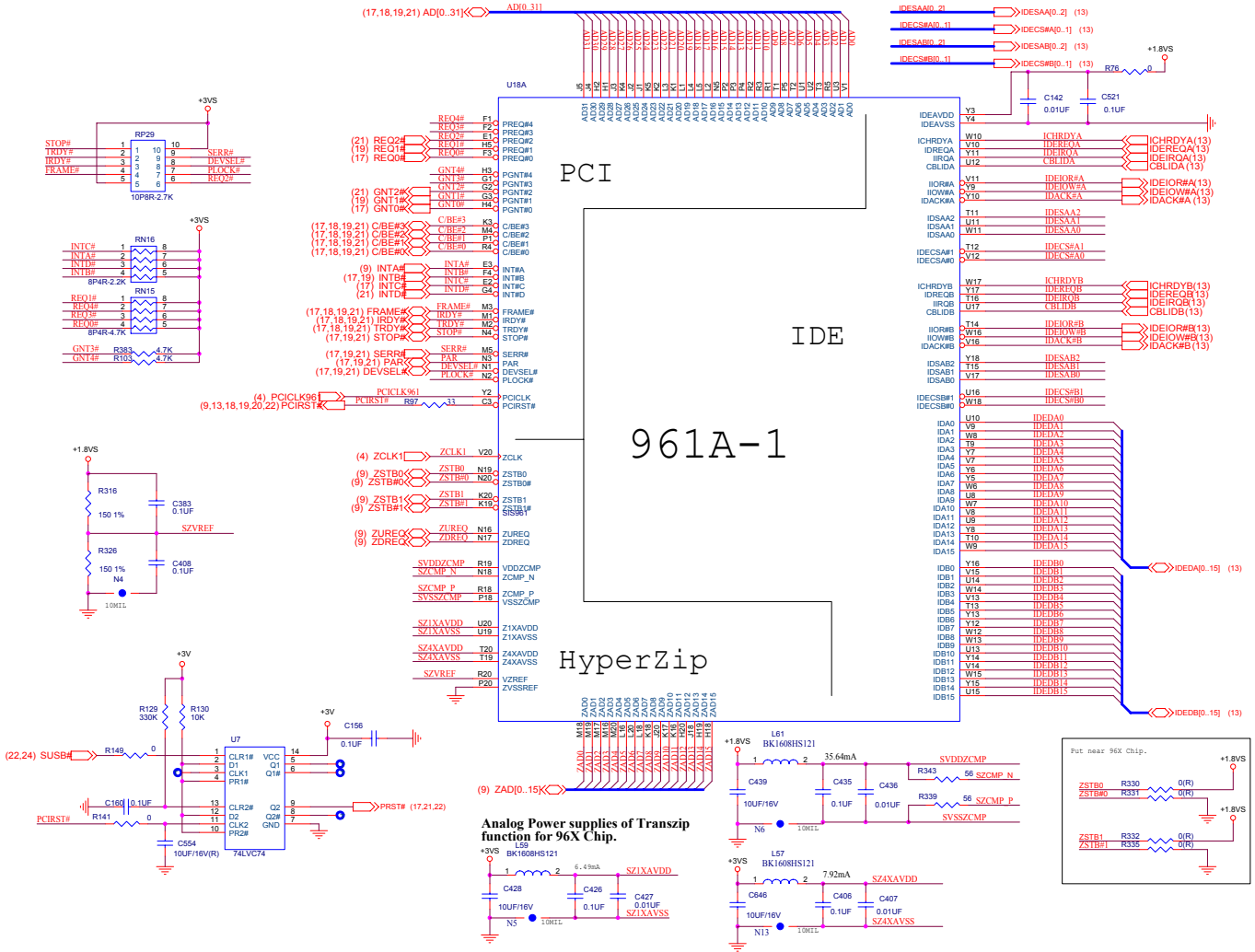
650-4 (Powers) - 4 of 4

Sheet 11 of 34
650-4 (Powers)
4 of 4



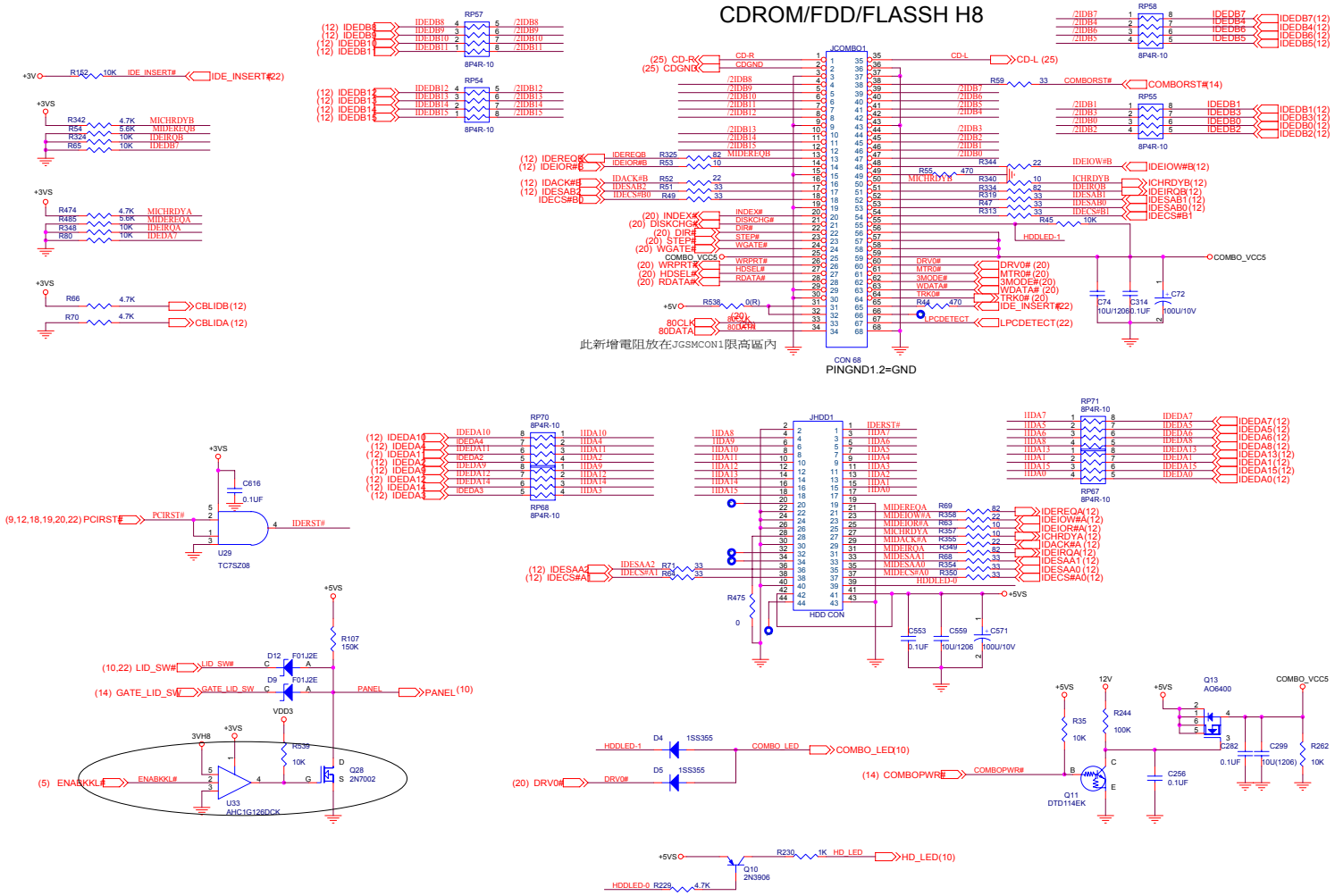
961A-1 (PCI / IDE / HyperZip) - 1 of 4

Sheet 12 of 34
961A-1
(PCI / IDE / HyperZip)
1 of 4



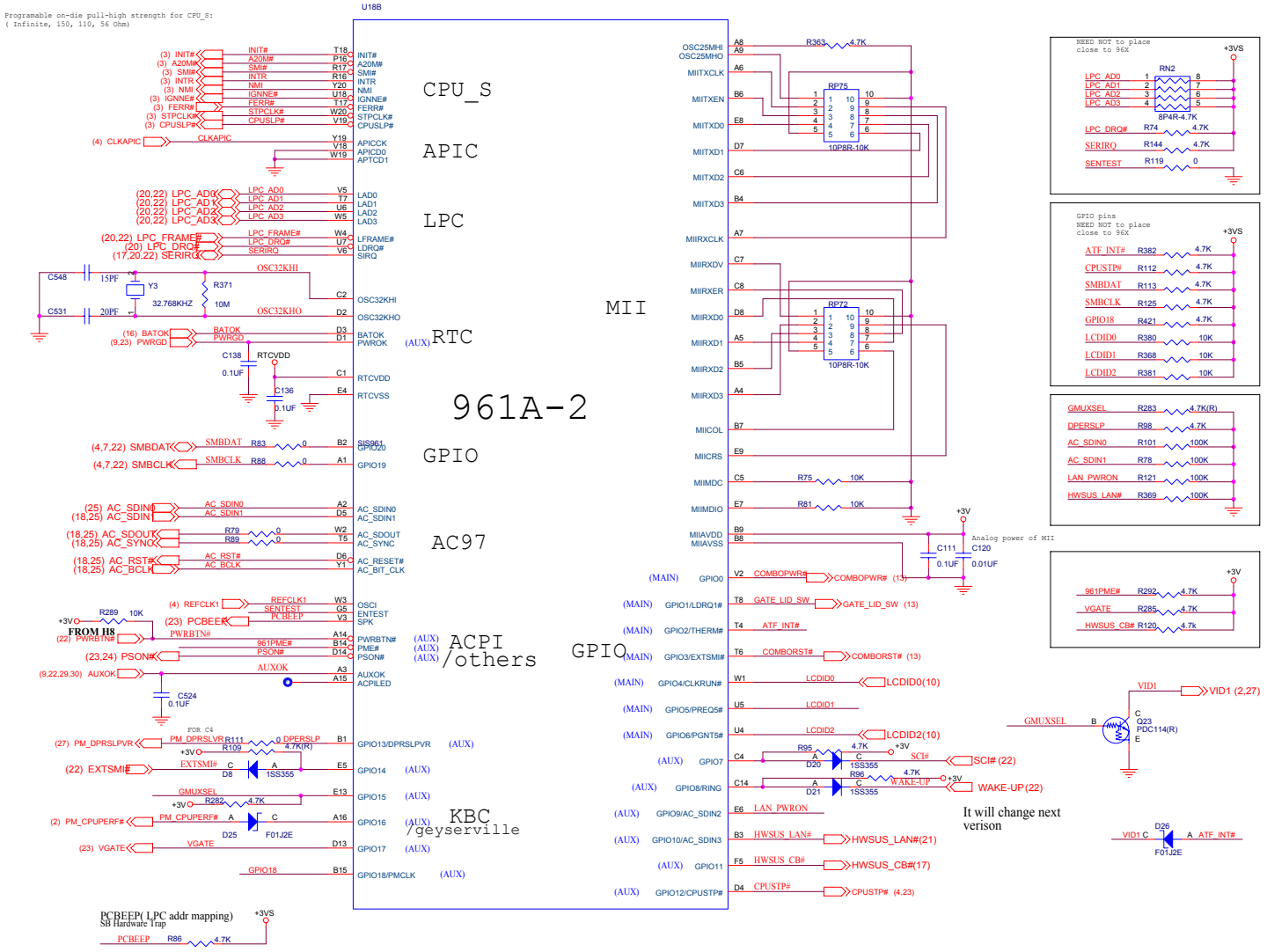
HDD / Combo CON

Sheet 13 of 34
HDD / Combo CON



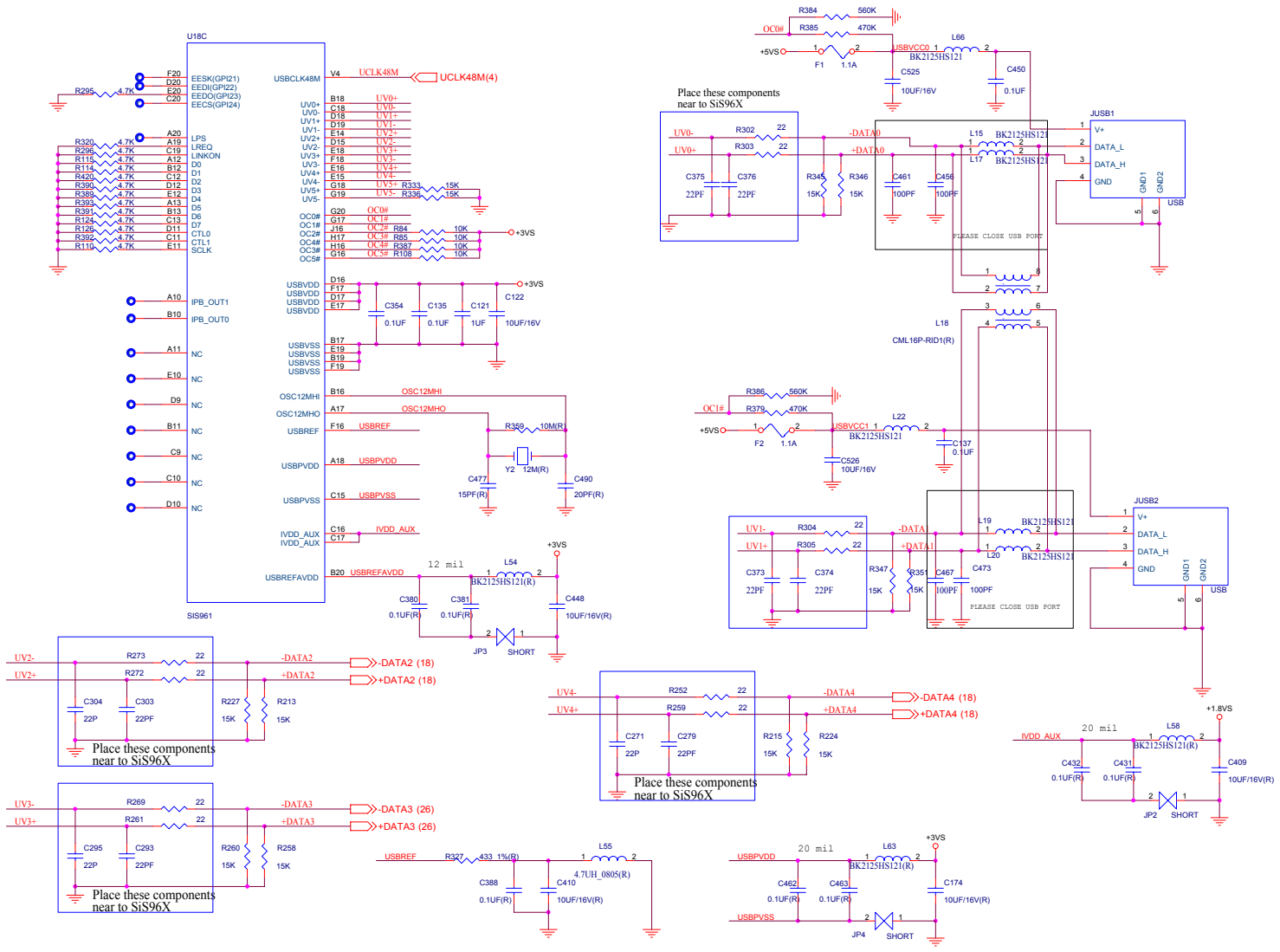
961A-2 (Misc Signals) - 2 of 4

Sheet 14 of 34
961A-2
(Misc Signals)
2 of 4



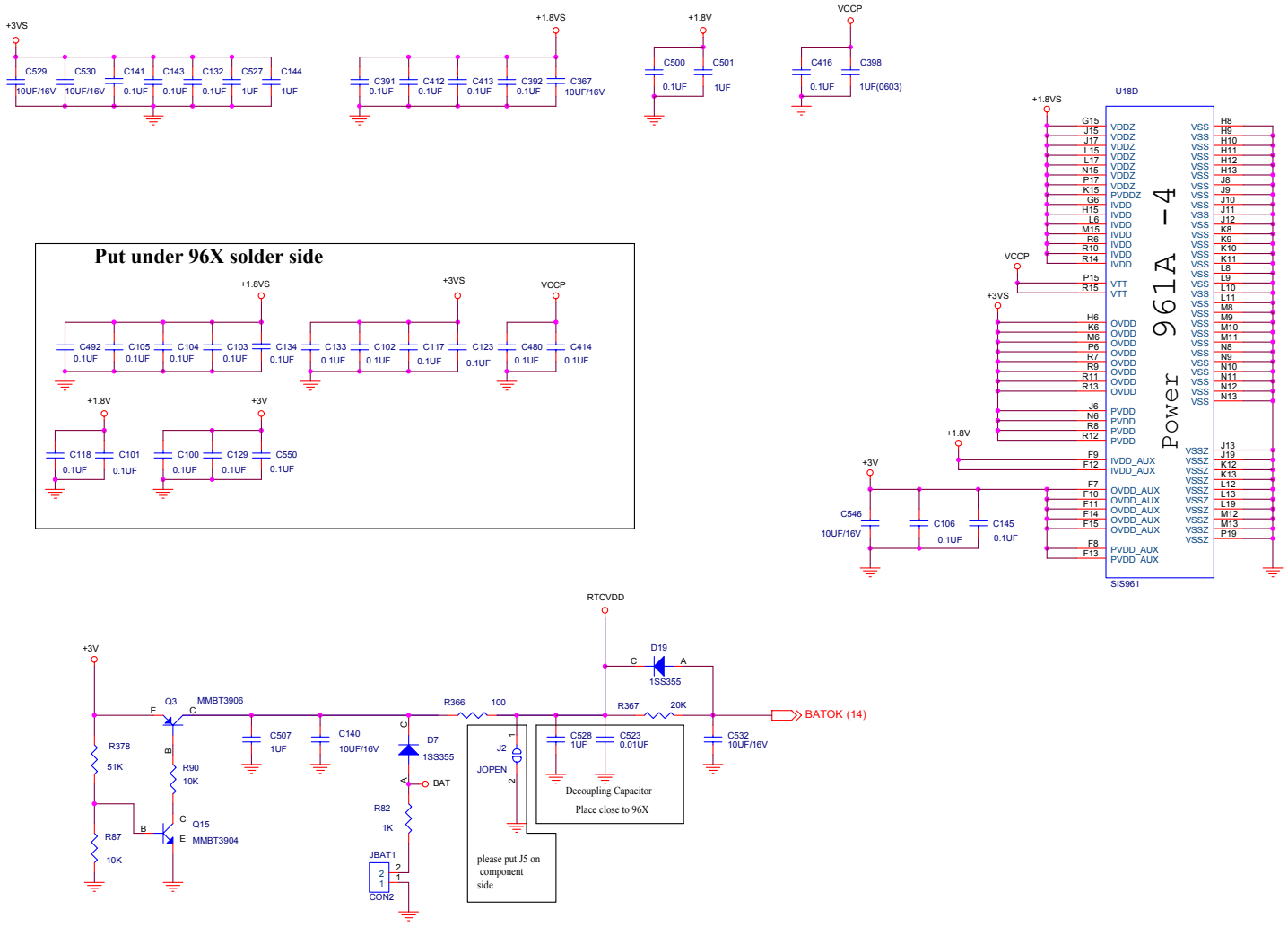
961A-3 (USB) - 3 of 4

Sheet 15 of 34
961A-3
(USB)
3 of 4



961A-4 (Power & RTC) - 4 of 4

Sheet 16 of 34
961A-4
(Power & RTC)
4 of 4



PCMCIA ENE1410

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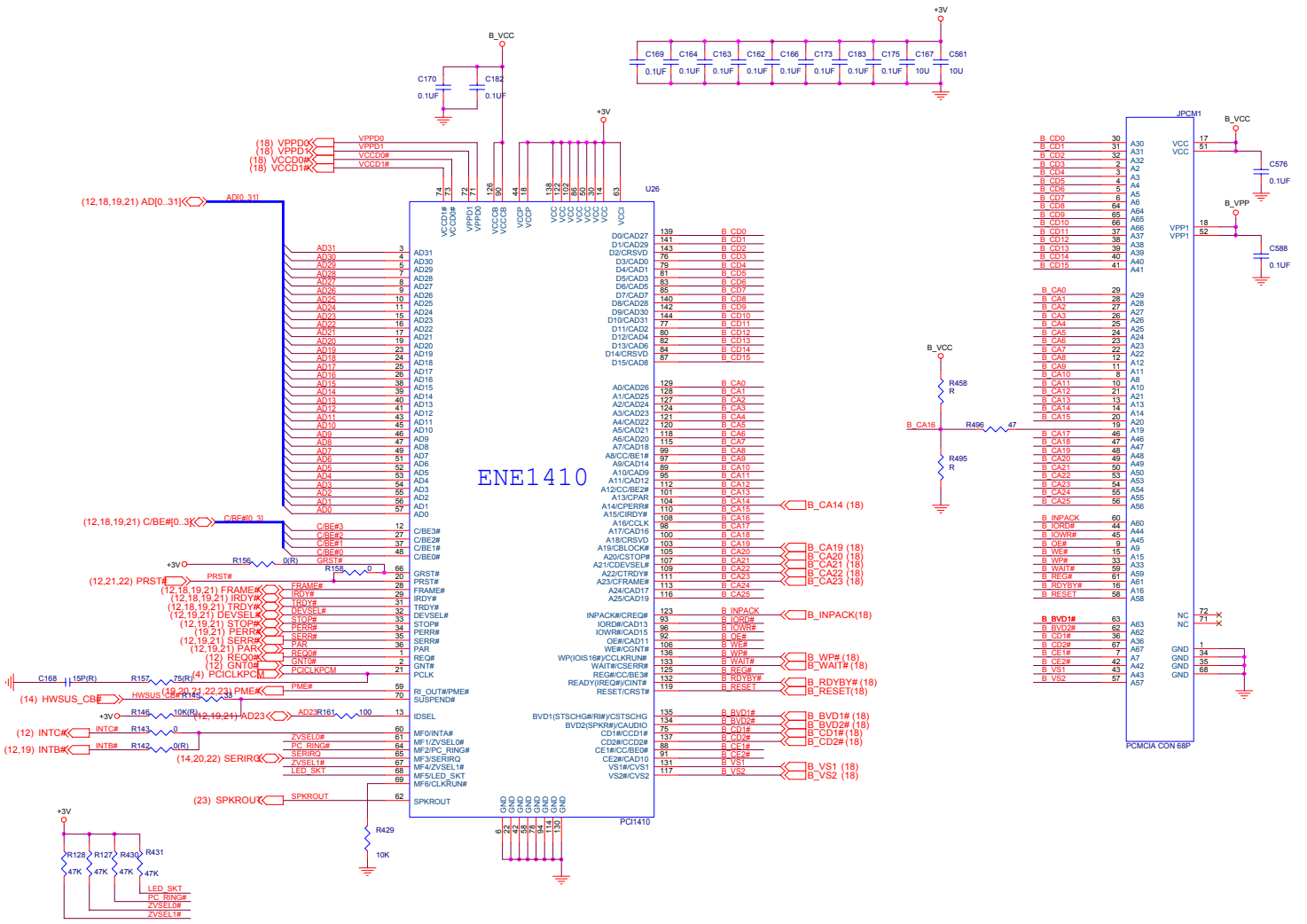
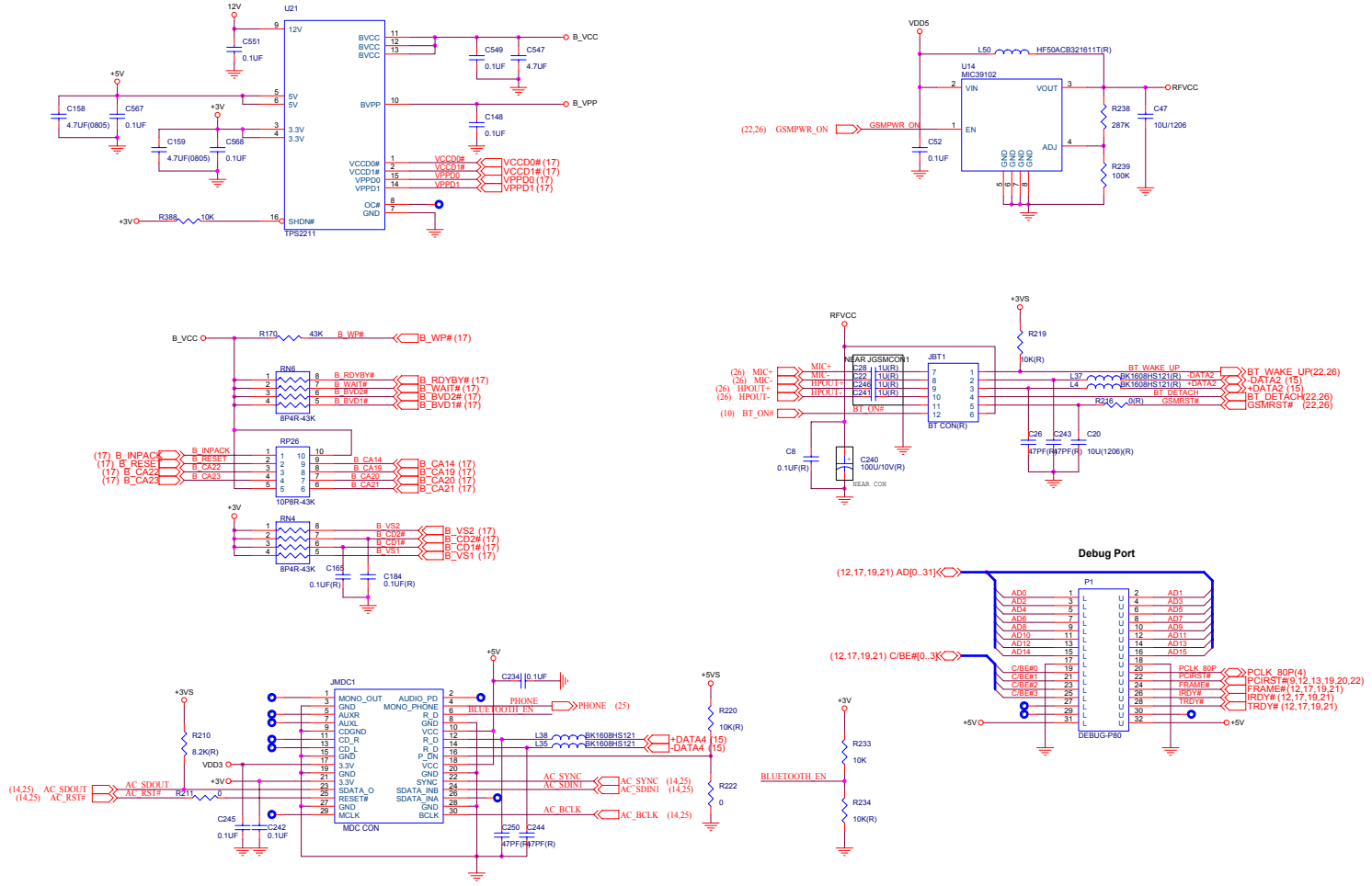
PCMCIA ENE1410

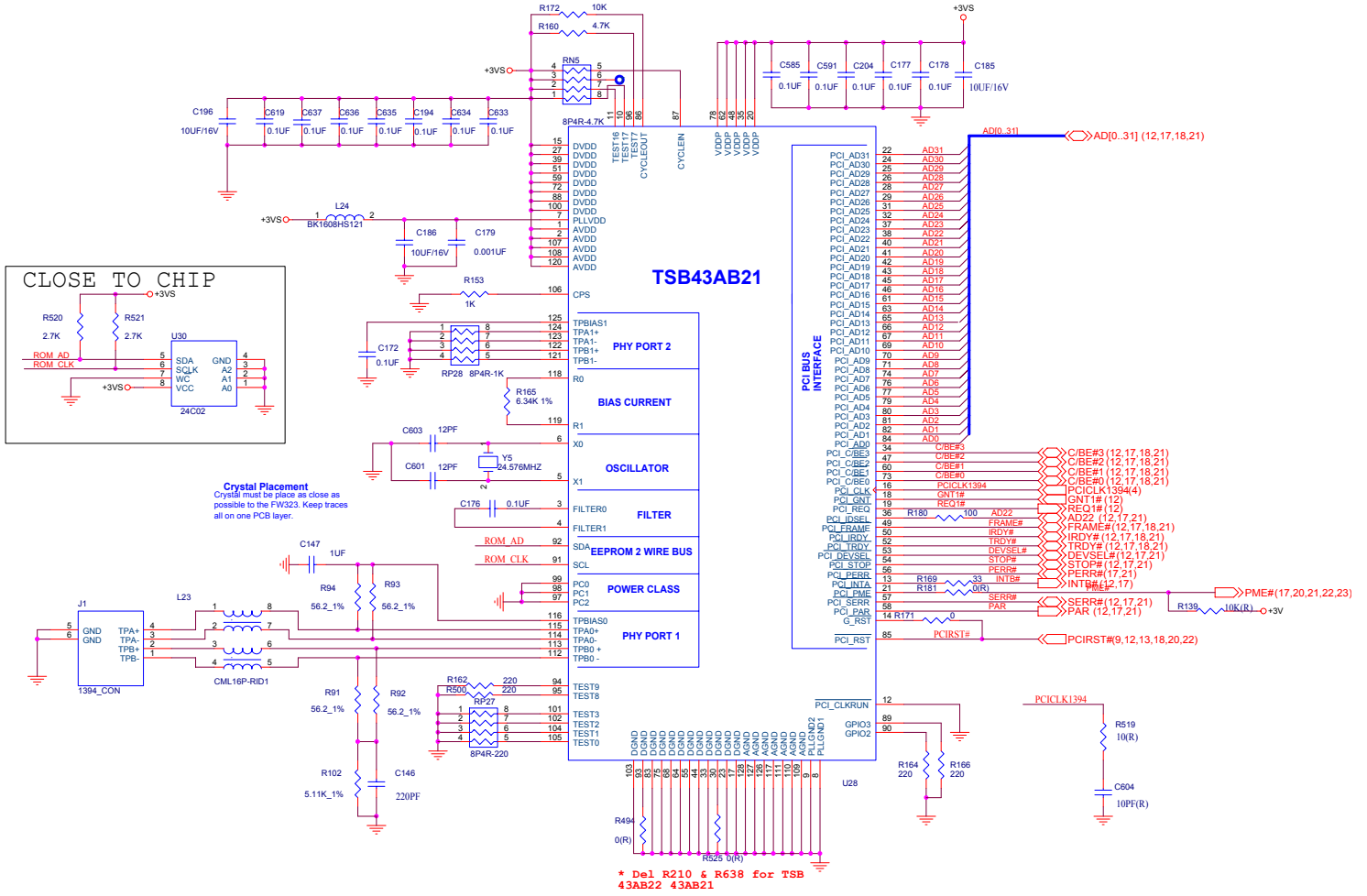


PCM PWR & Bluetooth Interface

Sheet 18 of 34
PCM PWR &
Bluetooth Interface

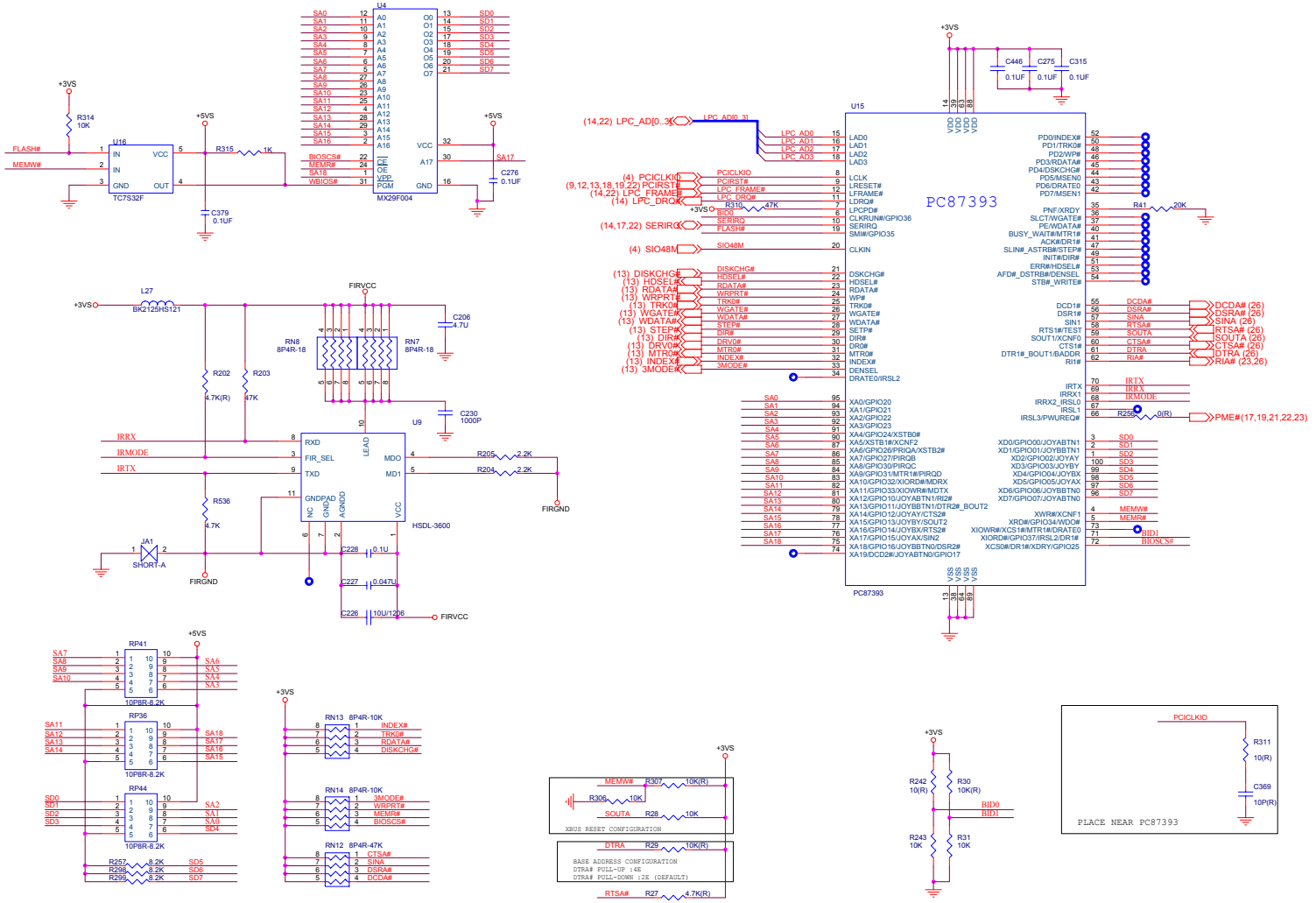


TI1394 TSB43AB21


TSB43AB21
CLOSE TO CHIP
PHY PORT 2
BIAS CURRENT
OSCILLATOR
FILTER
EEPROM 2 WIRE BUS
POWER CLASS
PHY PORT 1
PCI BUS INTERFACE
Crystal Placement
Crystal must be place as close as possible to the FW323. Keep traces all on one PCB layer.
* Del R210 & R638 for TSB 43AB22 43AB21

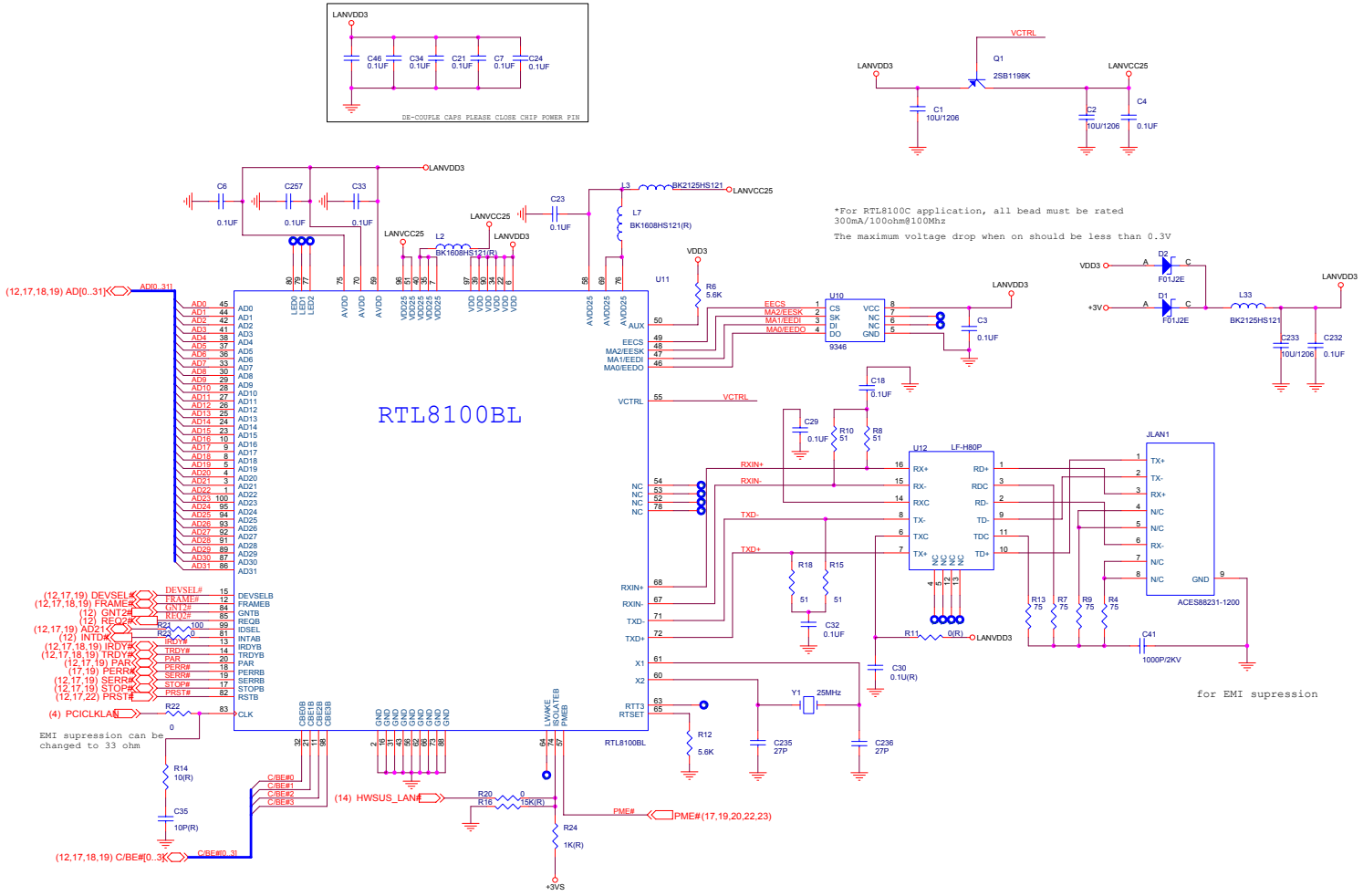
LPC Super I/O

Sheet 20 of 34
LPC Super I/O



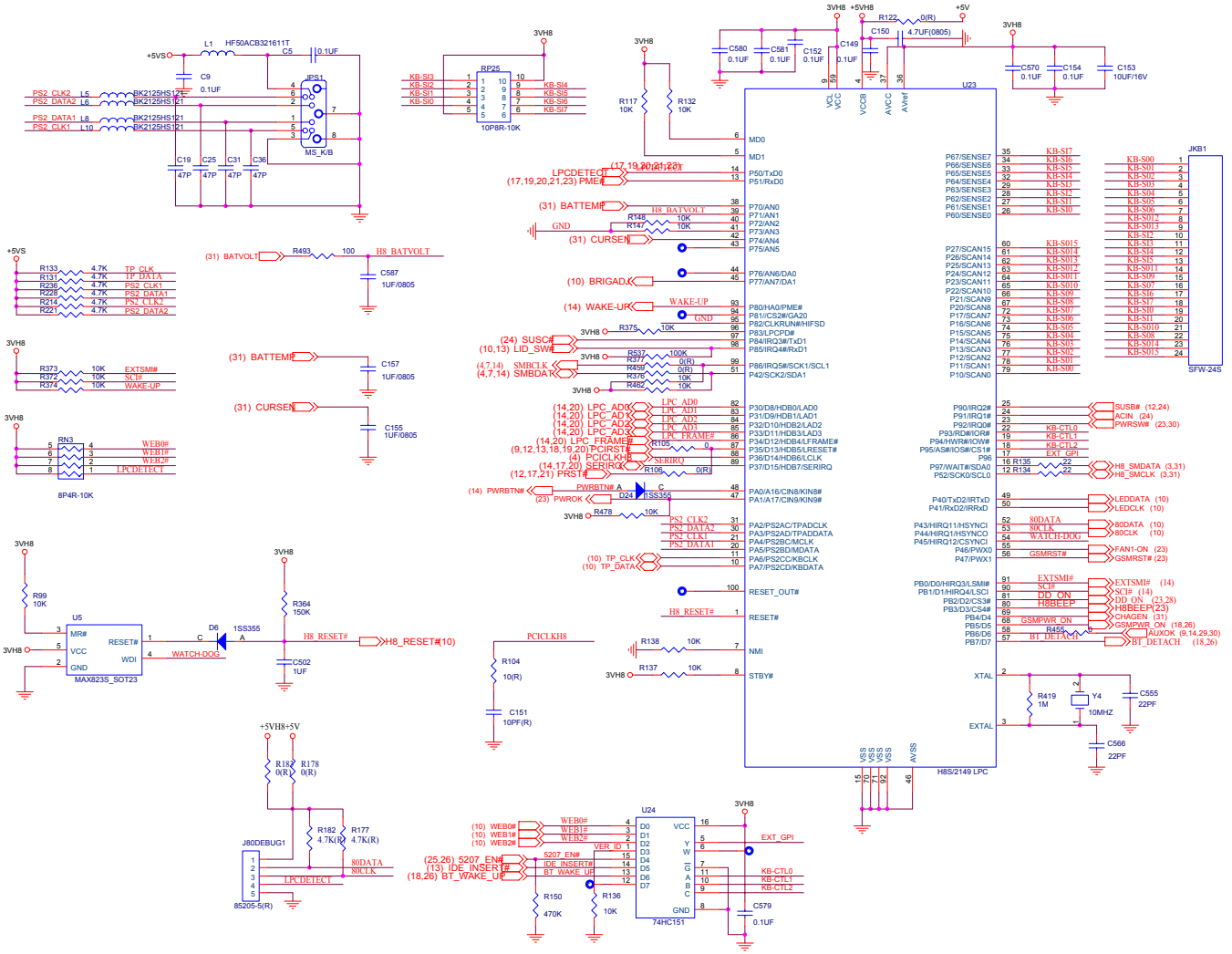
LAN RTL8100BL

Sheet 21 of 34
LAN RTL8100BL



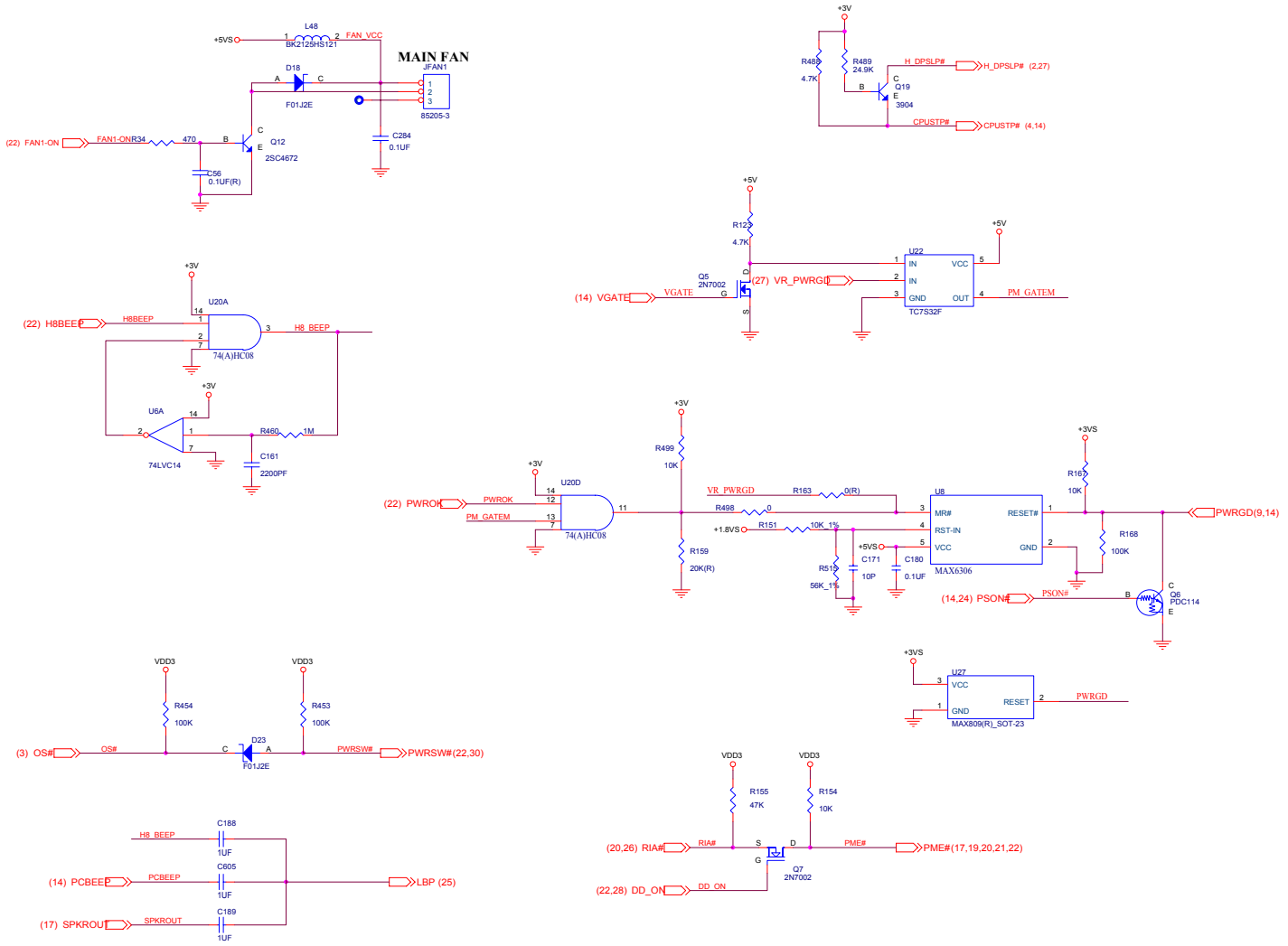
LPC - H8

Sheet 22 of 34
LPC - H8



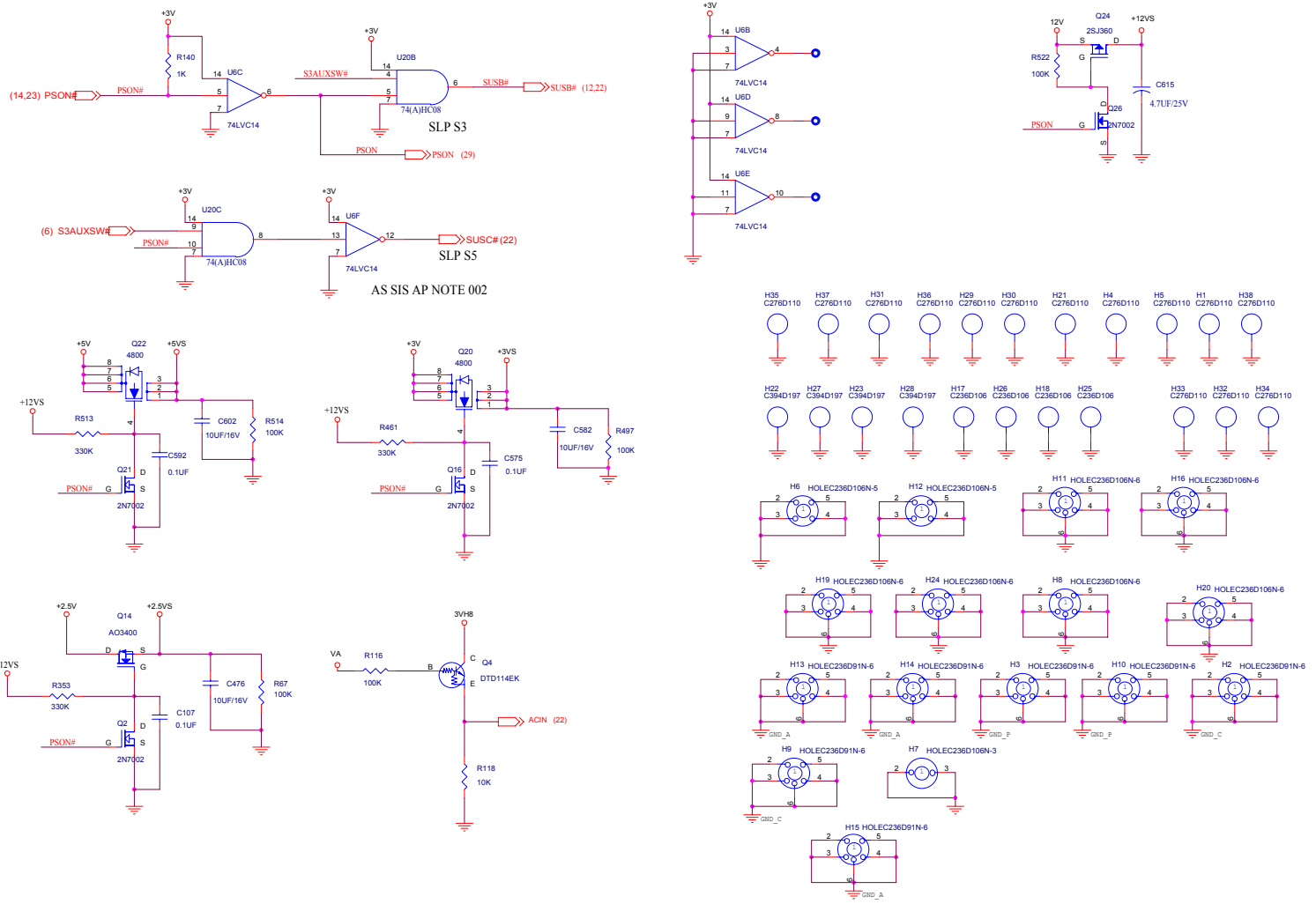
Fan Control & SpeedStep

Sheet 23 of 34
Fan Control &
SpeedStep



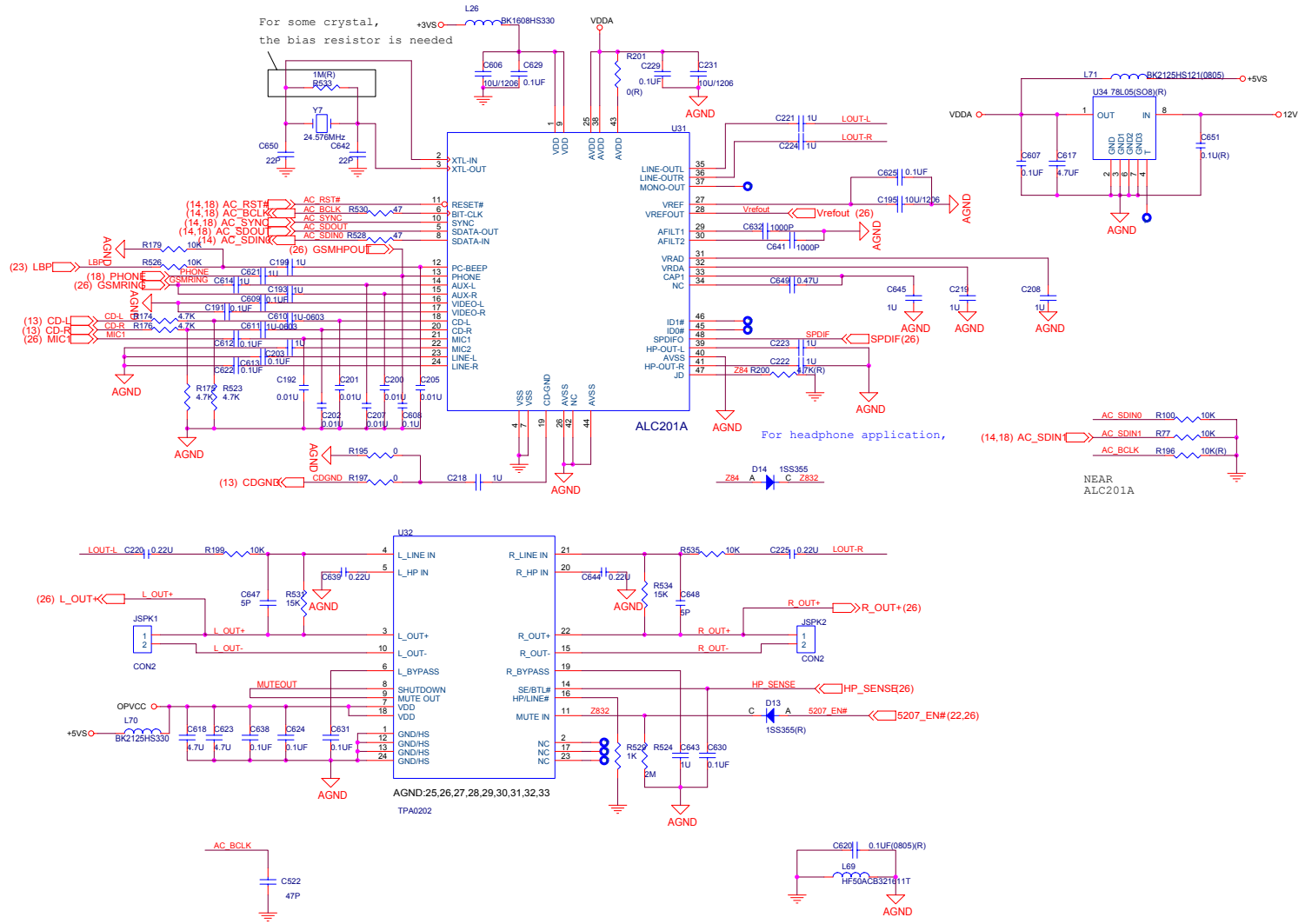
System Power Control Board

Sheet 24 of 34
System Power Control Board



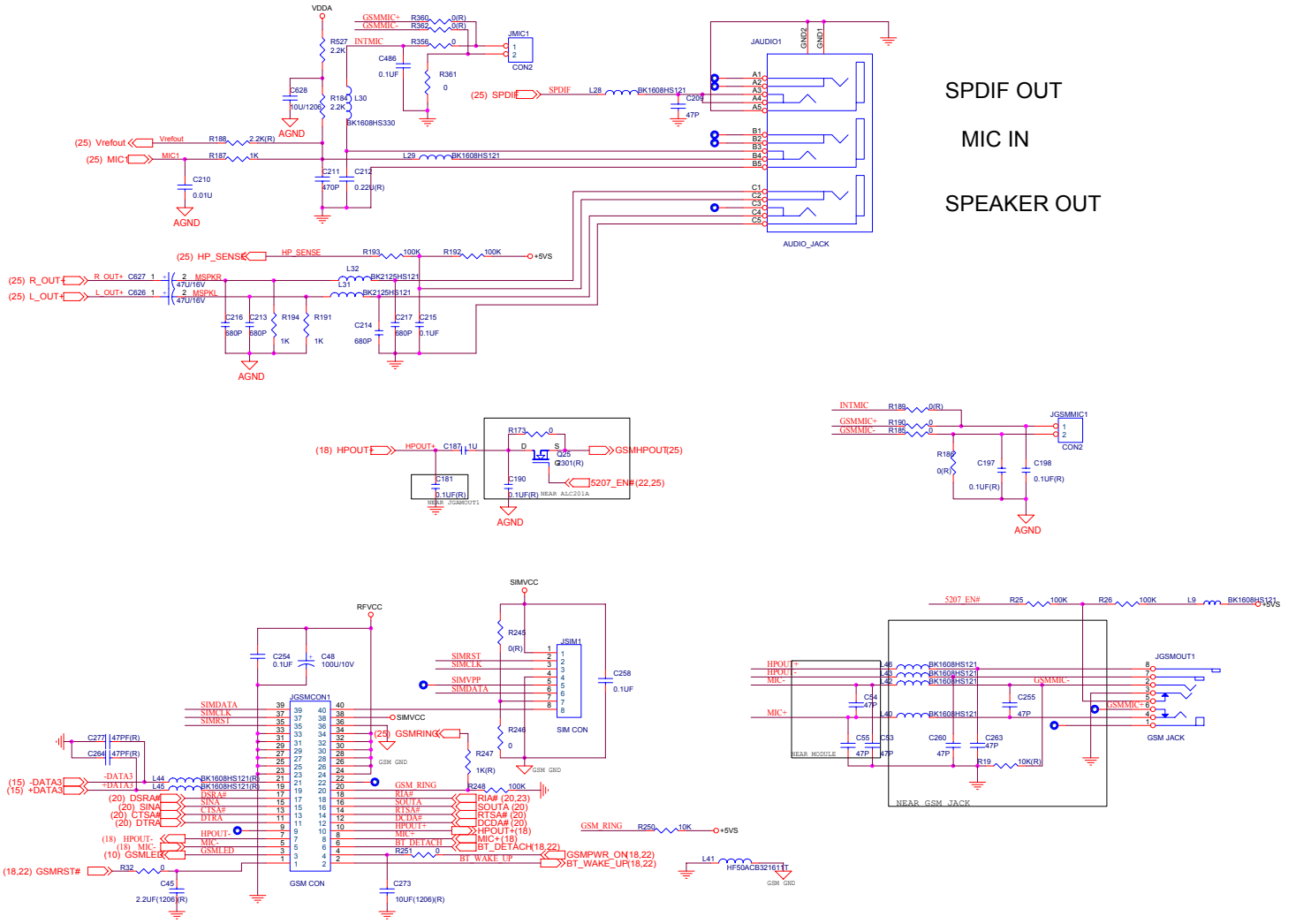
Audio Codec

Sheet 25 of 34
Audio Codec - ALC201A



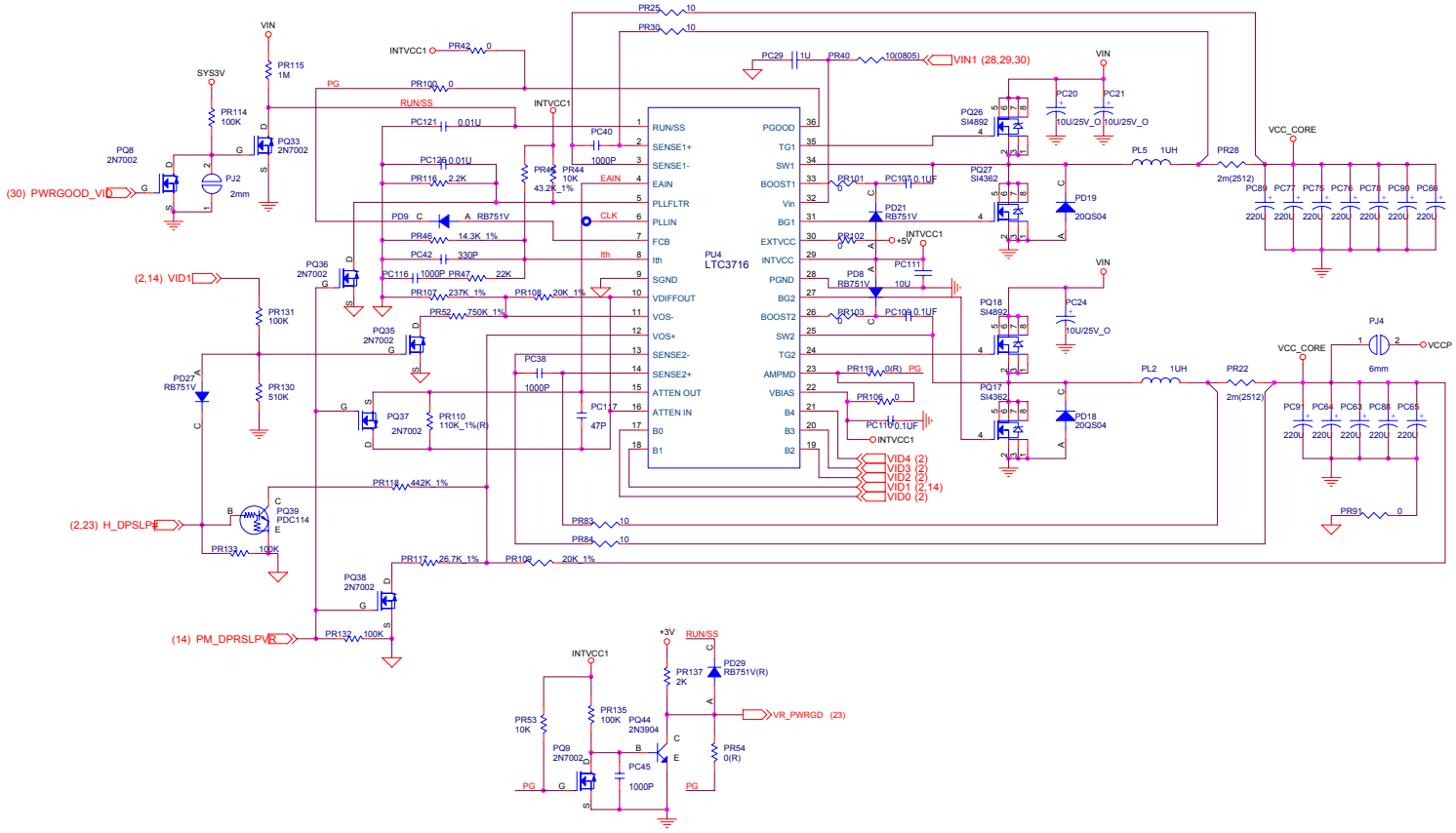
Audio Out / GPRS Connector

Sheet 26 of 34
Audio Out /
GPRS Connector



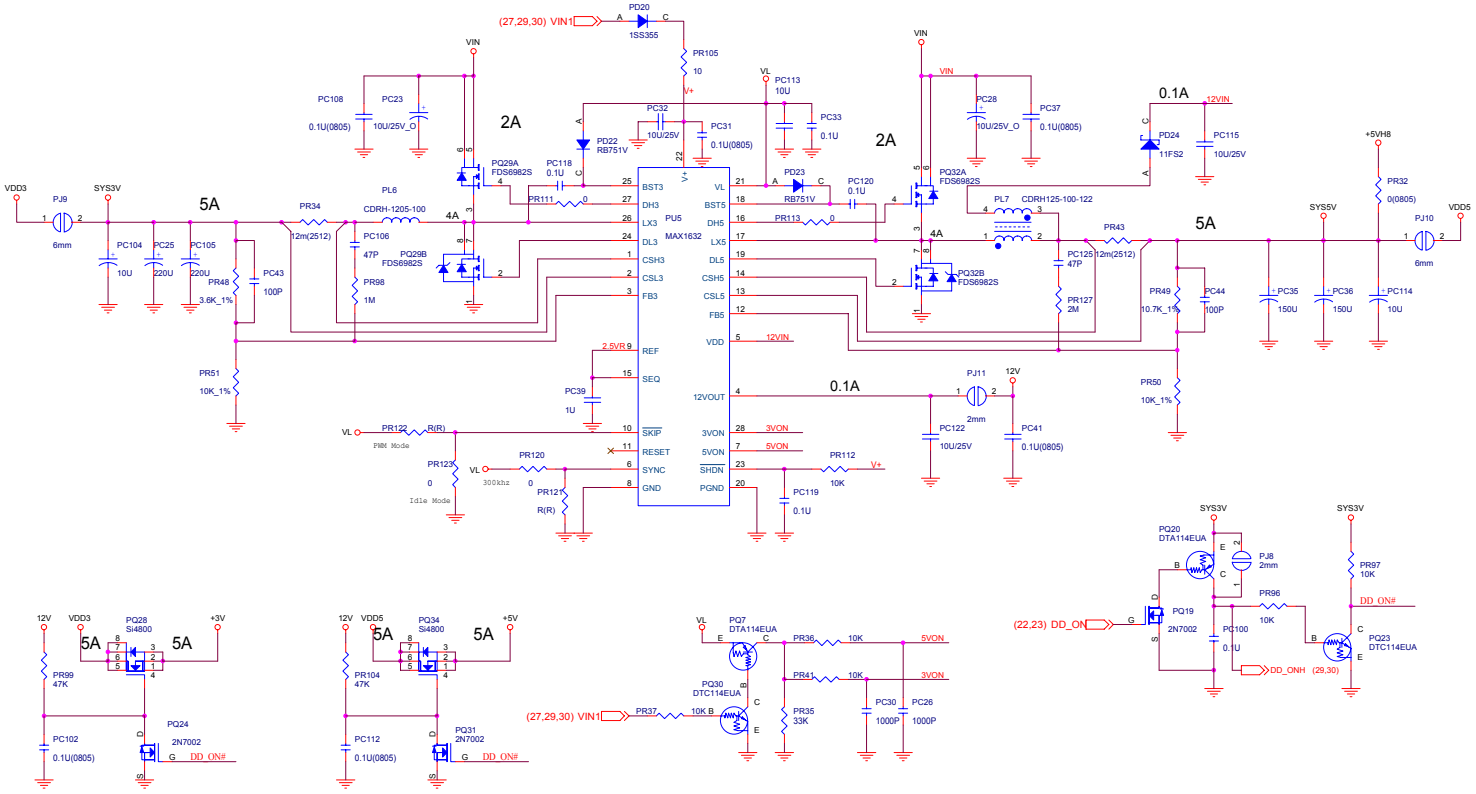
V_Core

Sheet 27 of 34
V_Core



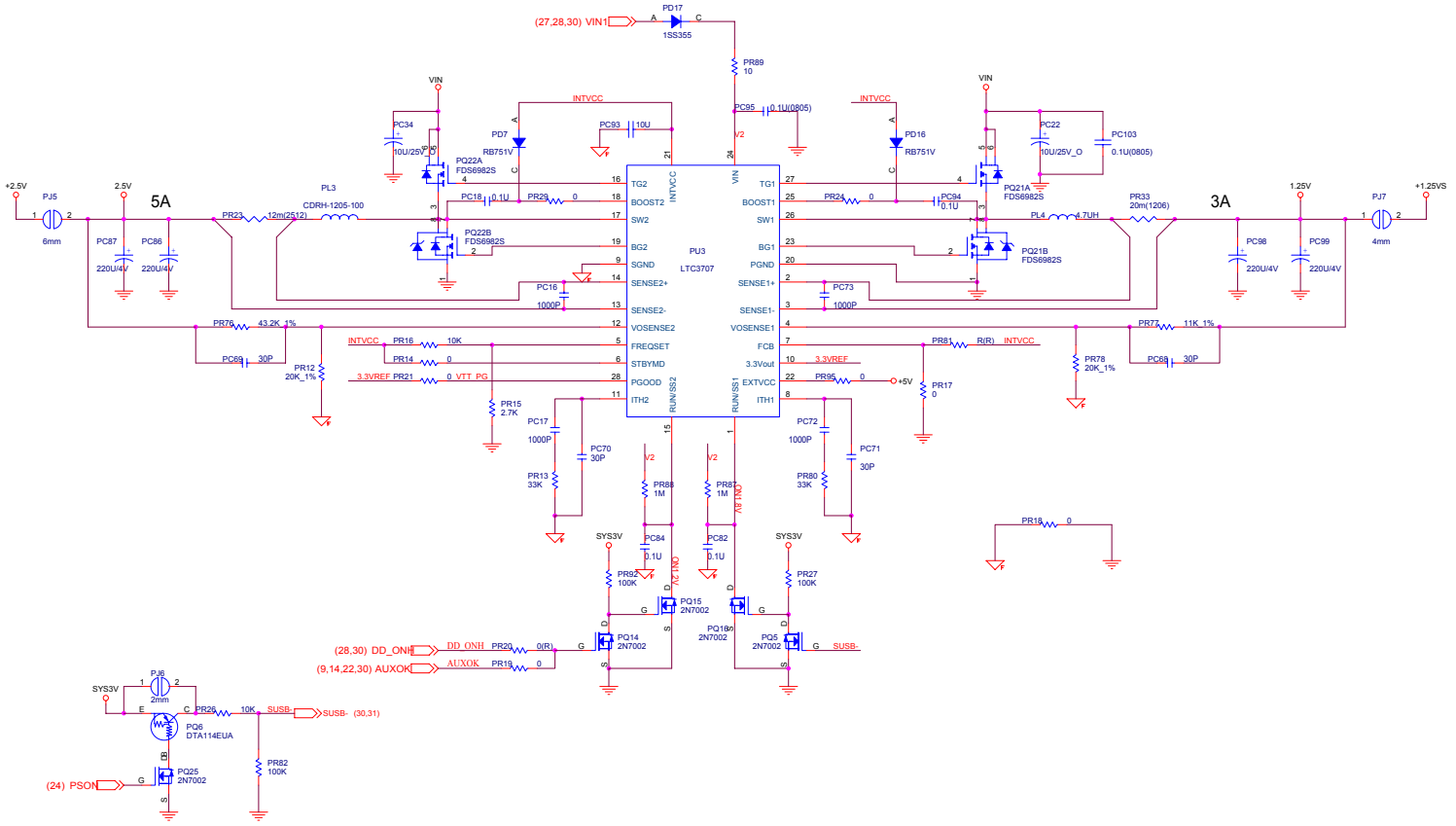
+3V, +5V, +12V

Sheet 28 of 34
+3V, +5V, +12V



+2.5V, +1.25V

Sheet 29 of 34
+2.5V, +1.25V



+1.8V, 3VH8, VDD 1.8, VCCID

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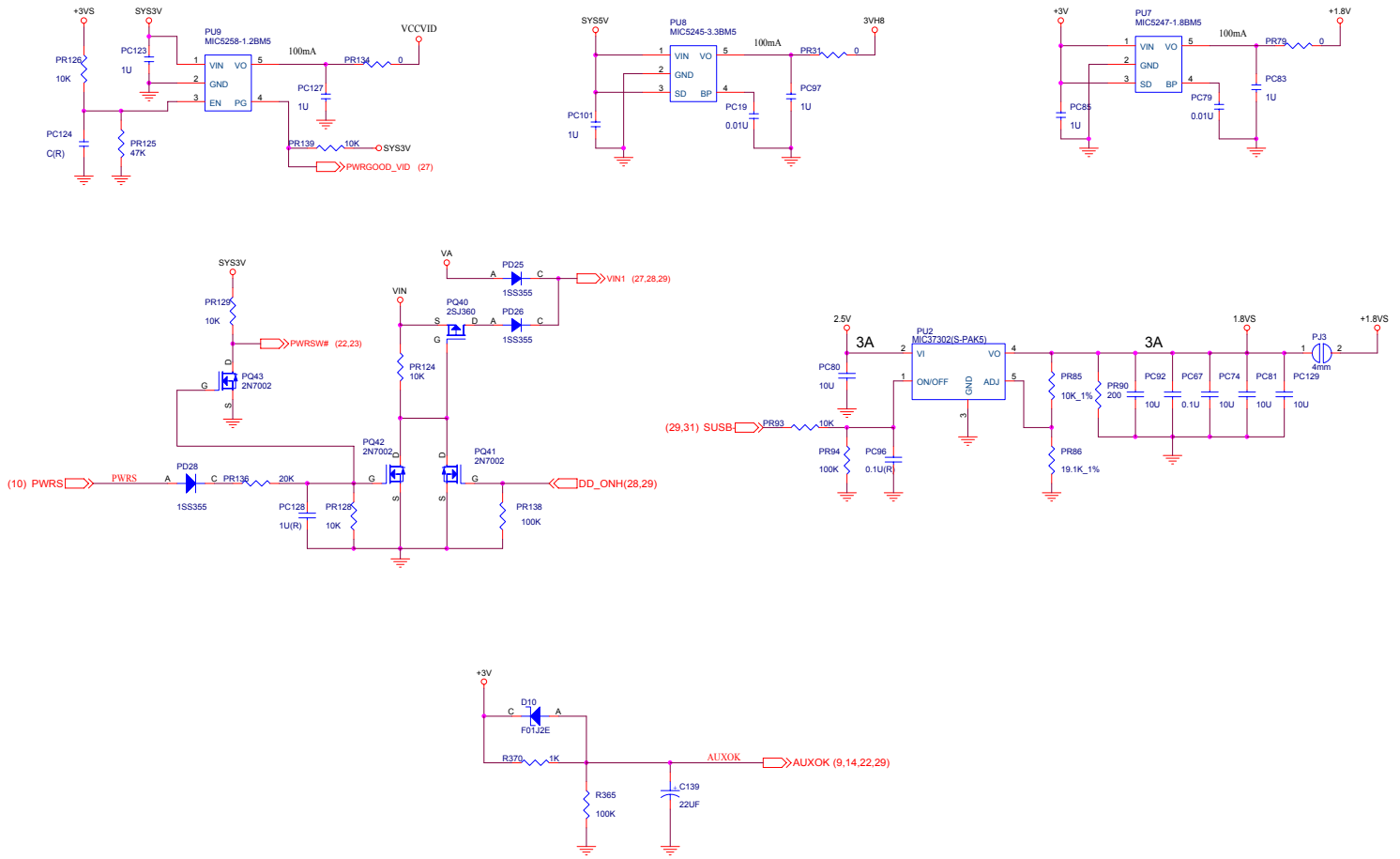
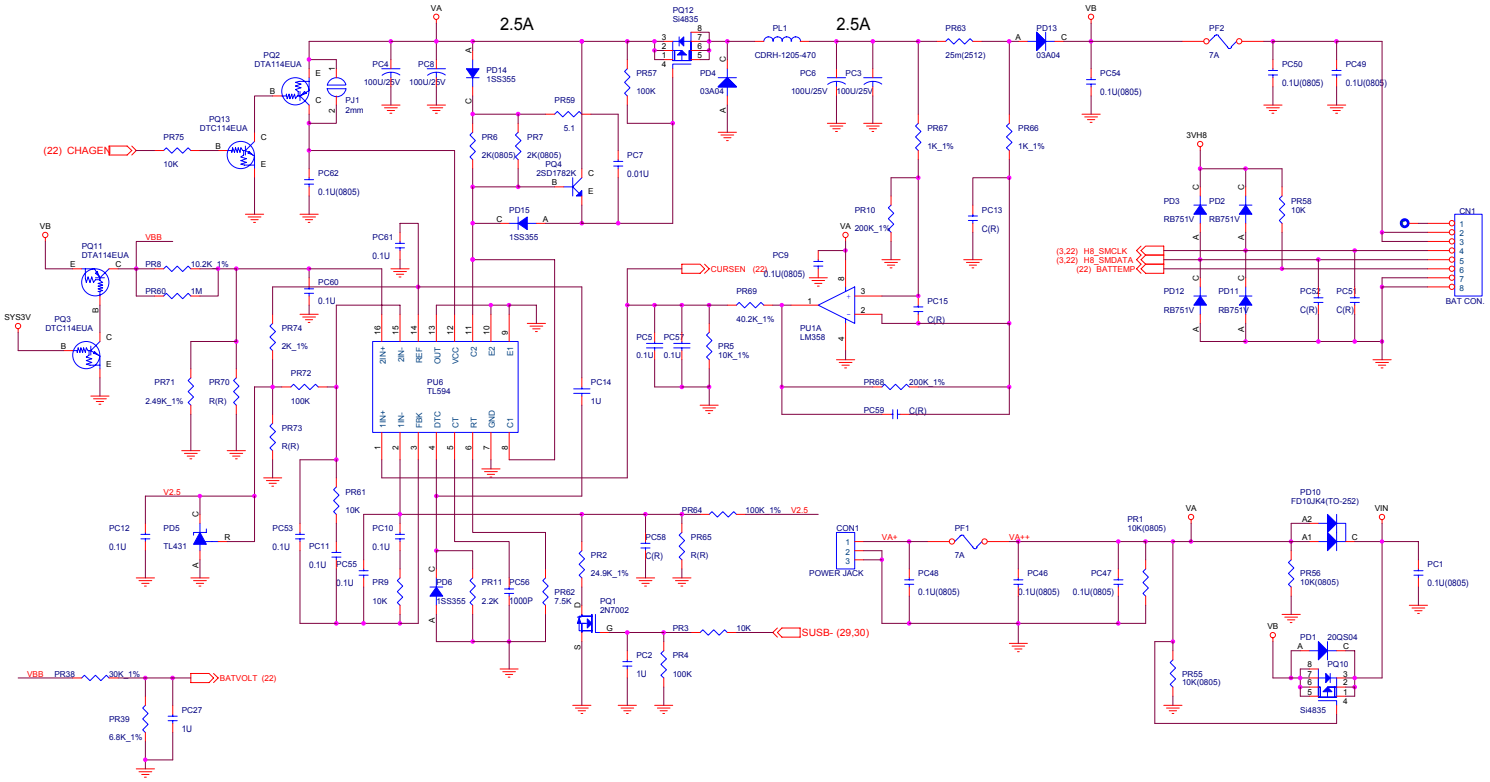
+1.8V, 3VH8, VDD1.8, VCCID



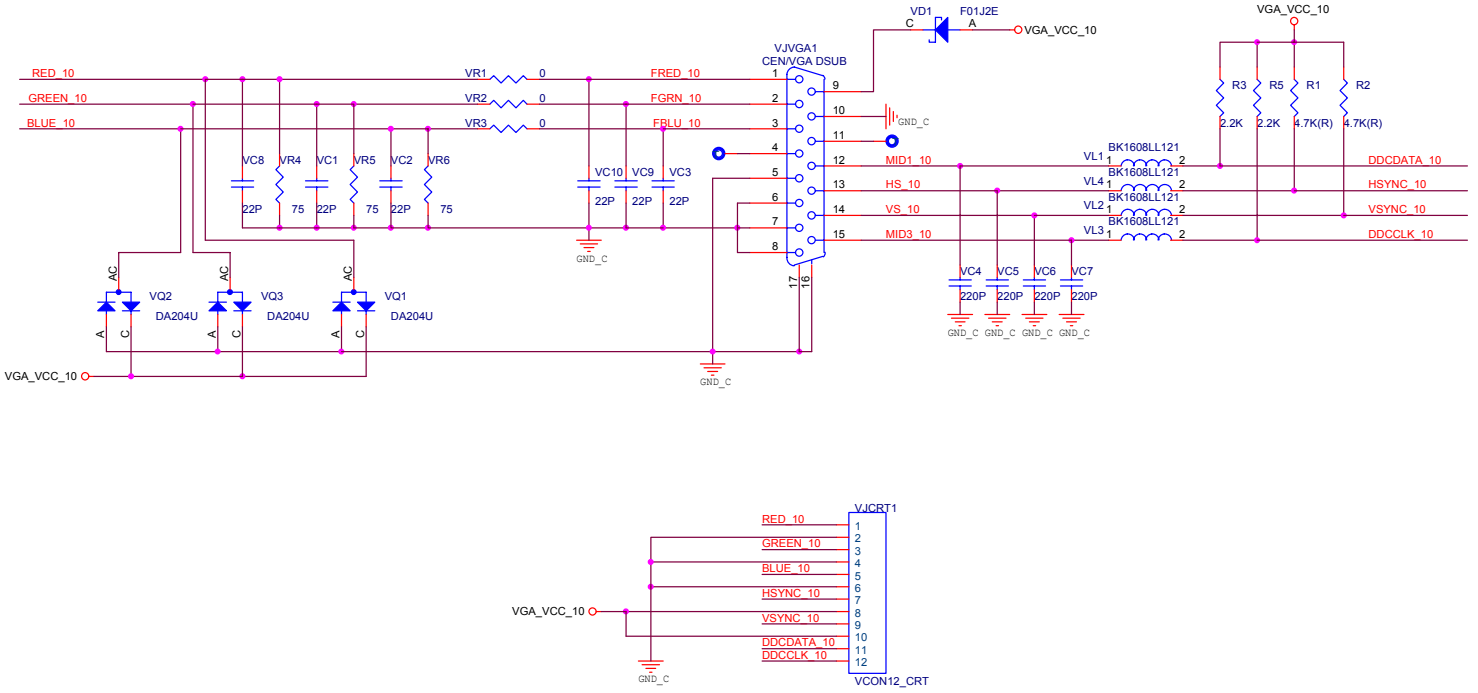
Charger - PWM

Sheet 31 of 34
Charger - PWM



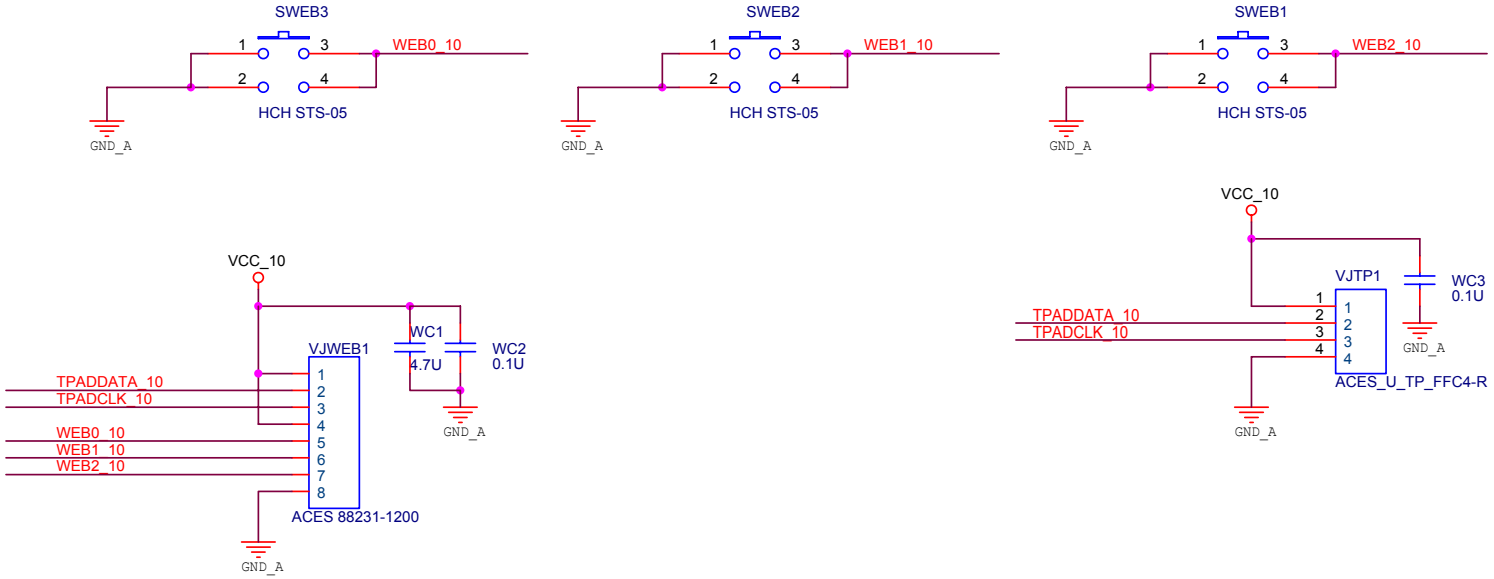
CRT Board

Sheet 32 of 34
CRT Board



Hot-Key

Sheet 33 of 34
Hot-Key



Power & Lid Switch Board

Sheet 34 of 34
Power & Lid Switch Board